STRATEGIC OUTLOOK FOR THE B.C. FISH PROCESSING SECTOR

DISCUSSION DOCUMENT

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SUMMARY

The British Columbia fish processing industry can be characterized as a food manufacturer selling mostly to world markets. As a food manufacturer, it requires access to high quality, reasonably priced raw material and other inputs such as labour. As an exporter, it faces heavy competition, unpredictable exchange rate fluctuations and other risks in the world marketplace. As a resource-based industry, it is subject to swings both in internal factors such as catch volumes and market prices, and in the general business cycle (interest rates, economic growth in major markets). The industry is very cyclical. The returns for the good years must tide the industry over the poor years, and the industry's capital structure must be able to accommodate these cycles.

The industry does not have security of supply of raw materials at a known price. Instead, it must competitively bid for fish each year. The industry pays for the raw material before it knows what the market returns will be. It makes raw material purchase decisions based on market expectations that may or may not be realized. Aggregate catches are biologically determined and highly variable. In short, the industry is resource-constrained, and raw material and final product markets are highly speculative and competitive.

Many factors affect industry viability, only some of which are in the control of processing firms. Depressed world prices brought on by dramatic growth in global salmon aquaculture production and huge wild salmon harvests in Alaska in successive years, a strengthening Canadian dollar, a high and rigid cost structure, high inventory carrying costs due in part to high interest rates, significant international tariffs on processed Canadian products, and strong publicly-funded promotional campaigns in competing countries all contribute to an unprofitable industry despite increases in the domestic catch.

In addition, historical advantages including control over raw fish supplies and a world reputation for high quality products are, in industry's view, now being compromised. Potentially significant salmon allocations to natives and recreational fishermen are a threat to security of raw material supply. The possibility of in-river for salmon fisheries and the associated quality degradation is seen to undermine the superior quality standards sacred to the industry. Protection from foreign competition afforded by trade regulations no longer exists. The culmination of these factors is an industry pessimistic about its long term viability.

The industry has both strengths and weaknesses relative to Alaska competitors and potential rivals in Washington State (see Exhibit 1). One region does not have an unambiguous competitive advantage. There are significant differences among blocks of firms within B.C.

The major strengths and weaknesses of the B.C. industry are:

Strengths	Weaknesses
1. High product quality allowing access to niche markets	1. Rigid price structure for raw fish
2. Lack of resource taxes (eg. Alaska Fisheries Business Tax)	2. High wage rates
3. Strong resource management	3. Cost burden on fish purchases (eg. WCB, UI)
4. Canned salmon brands	4. Fleet management practices
5. Access to skilled labour	5. Lack of a large national market

Industry firms realized inadequate financial returns during the 1980's, a decade encompassing both the trough and the peak of industry fortunes. In the 1980's the cost of fish purchases comprised 60% of sales revenue for the major companies. Production labour costs were the next most important cost component at 13% of sales.

In the past the industry seems to have paid too much for fish to earn an adequate financial return. The high cost of fish and rigidities in the pricing of fish, due in part to the common property nature of the fishery, appear to be major impediments to improved financial performance.

The increasingly competitive marketplace for seafood and other protein products appears to be a long-term structural change. The seller's market of the 1980's has turned into a buyer's market in the 1990's. The industry has a variety of strategies or options available to it, including altering or abandoning some long term practices in the buying of fish, product mix, and marketing (Exhibit 2).

The potential restructuring measures of Exhibit 2 are organized under five headings:

- raw material purchases,
- market development,
- efficiency measures,
- investment behaviour, and
- industry liaison.

The appropriate strategy for an individual company is firm-specific. The industry in general has to move from its production-oriented historical base to more of a market-driven business.

With such a change in philosophy and attendant changes in business practices, the outlook for the industry should be more optimistic. The industry has exhibited the capability for change since its inception, and there are opportunities for continuing change and innovation.

The industry has an abundant, well-managed natural resource. It has access to a productive labour force, world class processing plants and a world reputation for the quality of its products. The industry needs to work with these assets, and adapt their philosophy and practices to the changed economic circumstances.

In addition, there is much opportunity for benefits through greater communication and understanding between various stakeholders in the industry -- processors, fishermen, industry organizations and federal and provincial governments. This overview study, and the results contained within, can provide a forum for on-going communication between the various interests.

Exhibit 1: Comparative Advantage Among Processors

Category	Advantages Among Regions			Advantage Within B.C.	
	B.C.	Alaska	Washington[a]	Majors	Others
Raw Material					
1. Quality	✔				
2. Economies via Harvest Volume				✔	
3. Handling Practices	✔				✔
4. Harvest Location	✔				
5. Timing of Harvest					
6. Raw Fish Costs		✔		✔	
7. Additional Price Burden		✔			✔
8. Fish Acquiring Costs					✔
Labour					
9. Wage Rates (inc. Burden)		✔	✔		✔
10. Productivity	✔				
11. Access to Skilled Labour	✔				
12. Additional Labour Costs	✔				
Other Factor Inputs					
13. Transportation to Market	✔				
14. Energy Costs			✔		
15. Delivered Materials	✔		✔		
Demand					
16. Product Quality/Reputation	✔				
17. Branding	✔			✔	
18. Natural Market		✔	✔		
19. Niche Marketing	✔				✔
Macroeconomic Factors					
20. Interest Rates		✔	✔		
21. Tax Rates		✔	✔		✔
22. Exchange Rates		✔	✔		
Government Policies					
23. Inspection		✔	✔		
24. Generic Promotion		✔			
25. Resources Taxes	✔				
26. Resource Management	✔				
27. Fleet Management		✔			
28. Tarriffs Post FTA					

a *Raw material issues not addressed for Washington State since the competitive "threat" involves a Washington State - based processor accessing BC fish stocks.*

Exhibit 2: Potential Restructuring Measures

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1.0 INTRODUCTION

The fish processing industry of British Columbia has made a longstanding and important economic contribution to the province for over 100 years. The industry formed the impetus for the economic development of remote, coastal regions of the province.

At the turn of the century, the industry focused on one species of salmon (sockeye) in one product form (canned), and on dry salted herring. The primary market was the British Commonwealth and the United States. Since then, the industry has diversified to other species, other products and other markets.

The industry started with over 50 salmon canneries in operation along the coast close to the major raw fish supply sources. Over time, the industry rationalized into its present configuration with concentration of processing in the Lower Mainland and Prince Rupert areas. Significant economics of scale in canning, as well as improvements in transportation and refrigeration on vessels and in plants were the driving force behind this rationalization.

Today, four major companies dominate in salmon and herring processing (B.C. Packers Ltd., Canadian Fishing Co., J.S. McMillan Fisheries and Ocean Fisheries Ltd., hereafter called the "majors"). However, there is a significant competitive fringe comprising several second-tier and smaller processors.

The industry of the 1990's provides a wide variety of salmon, herring, halibut, groundfish and shellfish products to domestic and world markets. Exports represent two thirds of industry sales with Japan, the United States, and the European Community (EC) being the major markets. The Canadian industry has a very solid reputation in the world marketplace both for producing high quality products and for the integrity of its business practices.

The British Columbia industry is highly cyclical because of the nature of fish runs, and also because of its dependence on world markets. This extreme volatility is highlighted by events in the salmon and herring sectors over the past 15 years. These two species groups comprise over 80% of industry sales (salmon alone comprises over 60%).

1.1 Recent Performance

The industry has been affected by variability in fish landings, fish prices and the general business cycle. The late 1970's were a period of rapid expansion of demand for the main species of salmon and herring peaking with the year 1979. Market expansion was fuelled by a buoyant world economy and by increased demand for imported salmon in Japan as the catch of the Japanese high-seas fleet decreased under the extended fisheries jurisdiction adopted by many nations. A lucrative market in Japan for herring roe also had developed.

In the early 1980's, the value of the herring fishery collapsed from the boom year 1979 level and salmon prices decreased. Salmon catches were below long term averages. A world wide recession, record-high interest rates and unfavourable exchange rate fluctuations negatively affected the industry. A botulism

scare in Europe arising from Alaskan canned salmon dampened market demand for all canned salmon, including British Columbia product. Many fish processors experienced financial difficulties and a restructuring of the industry took place.

Restructuring took several forms, including the bankruptcy of some medium and small size firms, the sale of some Canadian Fishing Company assets to B.C. Packers, the closing of several buying stations, the selling of a 250-vessel processing company-owned gillnet fishing fleet to the Northern Native Fishing Corporation (NNFC), and an improved capital structure with less debt financing.

The fortunes of the industry rebounded in 1985 with a doubling of salmon catches from the 1984 level. In the mid to late 1980's, salmon catches were above recent long term averages, due in part to the Salmon Enhancement Program. Growing Japanese demand and favourable exchange rate fluctuations resulted in escalating prices for B.C. fishery products. New species development with the groundfish and shellfish fisheries occurred. Also, British Columbia salmon farming expanded rapidly at the end of the decade. The industry undertook a capital investment program of refurbishing and expanding several plants. Industry profitability improved.

Salmon wholesale prices were very high in 1988 and continually rose throughout the season. The B.C. industry managed to sell its production at these high prices but foreign buyers had difficulty moving the product without incurring losses.

The year 1989 was a turning point in industry fortunes. The extremely high product prices of 1988 resulted in large inventories of salmon in Japan, Europe and elsewhere in early 1989. These inventories, the 1989 large salmon catches in British Columbia and Alaska, increased farmed salmon production and strengthening of the Canadian dollar resulted in drastic declines in salmon wholesale prices. A strike of unionized fishermen and shore workers also occurred at the height of the salmon season.

The market quickly turned from a seller's market to a buyer's market. The 1990 year saw large carryover of canned salmon and weak initial prices which declined in-season as bumper harvests from B.C. and Alaska occurred again. An even larger inventory of canned salmon was carried forward to 1991.

This rapid turnaround of fortunes has caused much stress and anxiety in the industry. Historically the processing industry has fared well in high salmon volume years and in years in which runs of the high-valued sockeye salmon were strong. Both these events happened in 1989 and 1990, and industry revenues exceeded $1 billion for the first time.

However, the industry appears to have only broken even in 1989 and several companies incurred significant losses in 1990. The canning segment has always been viewed as less speculative than the frozen salmon market, yet it is the major canners who appear to have suffered the greatest losses in the 1990 high volume year.

The market turnaround was coupled with several uncertainties and changes in the institutional environment:

- changes in security of domestic supply with the 1990 GATT ruling giving the United States much greater access to B.C.'s salmon and herring catch;
- the advent of the Free Trade Agreement (FTA) with the United States;
- the looming settlement of Native Land Claims possibly involving a reallocation of a share of the commercial catch to Natives;
- possible fisheries management changes such as individual vessel quotas (IQ's), area licensing, a move towards harvesting salmon closer to river mouths, etc; and
- possible increased allocation of salmon to sports fisheries.

Many processors view the outlook for 1991 to be bleak. This view reflects the large inventory carryover, expected large total Alaskan, B.C. and farmed salmon supplies which would further depress prices, and weak world economies. There is considerable industry uncertainty and trepidation about its future.

These market, business environment and institutional trends and issues underlie the need to assess the long term outlook and environment for the B.C. fish processing industry. A key policy issue is whether the recent events described are symptoms of short term cyclical industry swings, such as occurred in the industry downturn of the early 1980's, or whether they are more long term and fundamental in nature.

1.2 Study Objectives

Fisheries and Oceans Canada, the B.C. Ministry of Agriculture, Fisheries and Food and Industry, Science and Technology Canada sponsored this study to develop a long term strategic outlook for the fish processing industry of British Columbia. The Steering Committee for the study comprised representatives from these three agencies, as well as from the Fisheries Council of British Columbia. The study entails:

- identifying long term market trends and opportunities;
- identifying the effect of domestic and foreign government policies on the performance of the sector;
- assessing the competitive strengths and weaknesses of the B.C. fish processing sector;
- identifying potential restructuring measures by industry, and the socio-economic impacts of restructuring.

The study results can assist industry and government in their planning responses for the 1990's.

Emphasis is directed at salmon and herring, the species groups of prime importance and the industry segments undergoing the most stress.

1.3 Study Approach and Report Outline

The study involved the following information collection activities:

- a formal questionnaire completed by 15 B.C. fish processors, and soliciting views on competitive position and issues facing the industry (the 15 processors completing the questionnaire represent over 60% of industry revenues);
- a mirror questionnaire to selected Alaska and Washington State processors soliciting views on competitive position;
- interviews with 13 representatives of industry, including 10 fish processors;
- market structure outlooks for Japan and the European Economic Community (EC); and
- analysis of secondary data and reports.

The next section presents an industry profile. Section 3 gives an analysis of the key underpinnings of the business environment of the industry. The following four sections address each of the four main study areas.

2.0 INDUSTRY PROFILE

The B.C. fish processing industry is a food processor that processes raw material fish and shellfish into finished or intermediate products. The majority of the raw material purchased undergoes significant value-added processing. Possible exceptions are halibut, sablefish and certain shellfish items which are sold quickly in essentially the same form in which they are purchased.

A variety of products are produced -- canned, frozen whole, fresh whole, fillets, steaks, smoked products, roe etc. The main salmon products are canned and frozen salmon. The main herring product is herring roe.

2.1 Description of the Fisheries

Inherent characteristics of the fish resource and the methods and timing of capture affect the product mix within each major species group. Harvests are very seasonal with the result that processing is also seasonal.

Salmon. Five species of Pacific salmon are caught in B.C. (chinook, coho, chum, pink and sockeye). The Pacific salmon are anadramous -- they spend a significant portion of their life in the ocean but spawn in freshwater (and die after spawning once).

Salmon are harvested by purse seine, gillnet and troll gear. Trolling is a hook and line fishery using lures whereas the other two gears are net fisheries. Perishability varies greatly among the five salmon species with pink salmon breaking down the most quickly. The main salmon season is July through October.

Troll gear generally provides a higher quality landed salmon than does net gear because it avoids bruising of the flesh, net marks and scale loss. Troll fish are also dressed and individually iced or frozen soon after capture. Troll fish are caught seaward from the coast and are destined for the premium quality fresh/frozen market.

Salmon net fisheries target on schooling fish located closer to their freshwater spawning grounds, and generally capture salmon of more advanced sexual maturity than the troll fishery. Physical changes related to sexual maturation decrease the flesh quality but improve the egg or roe quality. Net fish are handled in bulk and usually are not processed until reaching the plant in round whole form, often several days after capture. Accordingly, the majority of net-caught salmon traditionally has gone to the canned markets (canned markets can accommodate lower quality fish). However, on-board refrigeration and handling techniques have improved dramatically over the past 15 years. The result has been that a significant share of net-caught salmon can now meet fresh/frozen market quality standards.

The culture of salmon principally in sea cages was launched in the province during the 1980's. Chinook and coho were species initially cultured, but recently Atlantic salmon have been introduced. The fish is bled, dressed and iced soon after harvest. Most of the product is sold in fresh form.

Herring. The herring fishery is targeted at the capture of female fish just prior to spawning. The fishery takes place during a very short

period in March of each year, at which time the whole herring are frozen. After several weeks in cold storage, the roe is extracted over a period of months. The carcasses are used in production of fish oil and fish meal. Purse seines and gillnets are used to harvest the fish.

A limited herring spawn on kelp fishery also occurs. Fishermen impound spawning herring in ponds containing fronds of kelp strung on lines. The roe-laden kelp is harvested, dried and cut for the Japanese market.

Halibut. Halibut is caught mainly on longline gear, using a baited hook and line. Recently the fishery has involved two or three short fisheries within the year of less than a week each. In 1991 the fishery is moving to an individual quota fishery for the first time. Processing of halibut is limited, with over 90% of B.C. halibut sold as either fresh or frozen whole fish.

Groundfish. Groundfish involve a variety of species including sablefish, sole, hake, rockfish (red snapper, Pacific ocean perch) and Pacific cod. Groundfish generally are long-lived, non-migratory species and are caught year round. Groundfish are caught by trawl nets and hook and line methods. The fish can be landed in either unprocessed round or semi-processed dressed form, and in a fresh or frozen-at-sea state. Much of the groundfish is processed by B.C. plants into fresh or frozen fillets.

Shellfish. A wide variety of shellfish and crustaceans are harvested, including shrimp and prawns, crabs, clams, sea urchins and cucumbers, and geoducks (a five-year closure of the abalone fishery was initiated in 1991). Cultured oysters are also harvested. The harvest is taken from small boats using traps (e.g. crabs), trawls (e.g. shrimp), diving techniques (e.g. geoducks) or other gear. The fishery is geared to high unit value specialty products.

2.2 Long Term Revenue and Volume Trends

The industry has grown from less than $125 million in sales in the early 1970's to $1 billion in sales in 1989. Sales of salmon, herring and other fish products all have increased, but the greatest percentage increases have occurred in non-salmon products. The industry is still highly dependent on salmon, but not as much as it was 20 years ago (see Appendix A for data on product values and volumes).

Much of the increase in processed value can be attributed to general price increases in the world economy. From the early 1970's wholesale value has approximately doubled in constant 1990 (inflation adjusted) dollars, with essentially all of the increase due to the production of fish products other than salmon, and essentially all of the increase occurring in the late 1970's. Industry revenues in constant dollars are no greater today than in 1979.

In 1989 the wholesale value of fish processed in British Columbia was $1,018 million. Today, over half the processed value represents sales of (wild) salmon products. Wild salmon and herring combined represent three quarters

Exhibit 2.1: Wholesale Value of BC Fish Products

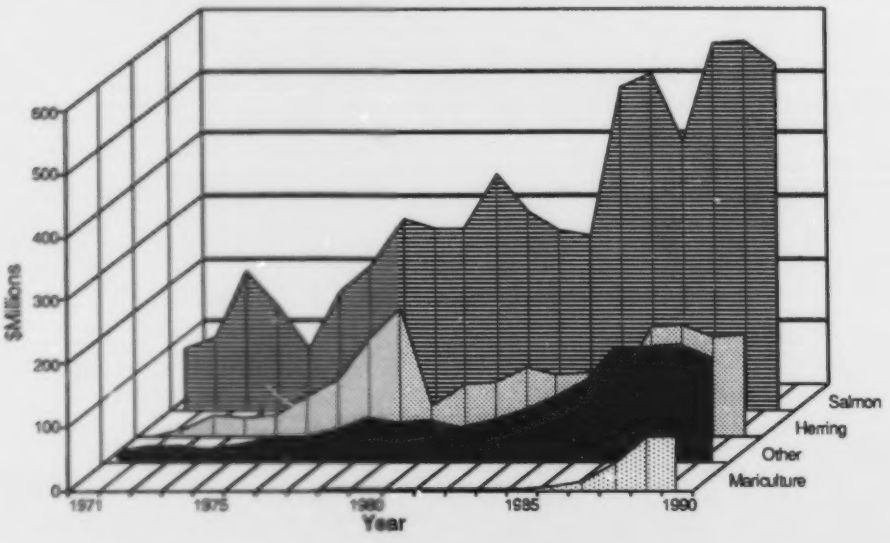
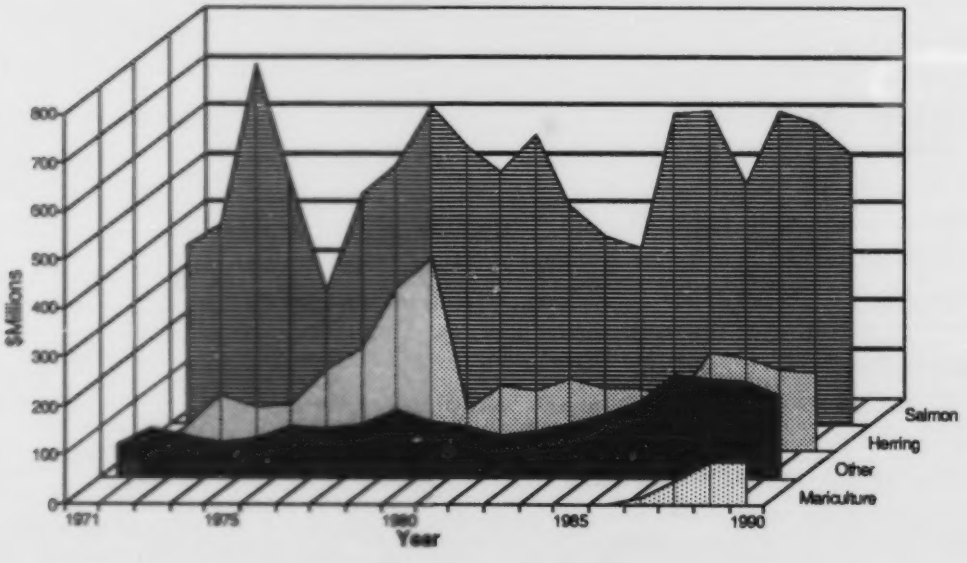


Exhibit 2.2: Wholesale Value of BC Fish Products Constant 1990 Dollars



	Wholesale Value $millions						
Species Group	**1990**	**1989**	**1988**	**1987**	**1986**	**1985**	**1984**
Salmon Mariculture	85	85	43	13	3	1	1
Wild Salmon	551	587	583	426	536	512	276
Herring	163	158	175	174	88	103	99
Halibut	32	28	27	34	26	16	12
Groundfish	77	86	86	95	71	61	47
Shellfish	57	72	72	56	35	28	26
Other	1	2	1	-	-	-	-
All	**966**	**1018**	**987**	**798**	**759**	**721**	**461**

Source: *B.C. Ministry of Agriculture and Fisheries (1984 to 1989); ARA Consulting Group estimates (1990).*

of sales value. Farmed salmon production is approaching 10% of total industry sales.

Over the 1978 to 1988 period the mix of salmon wholesale value has been:

- 47% canned
- 41% frozen whole
- 12% fresh, roe, other.

No discernible trend in the mix of salmon product values over the period is evident. In years of high salmon landings (especially pink), such as 1985 and 1986 however, a greater share of wholesale value is attributable to canned product.

B.C. salmon canners use both British Columbia and Alaskan salmon raw material. From 1980 to 1990 British Columbia canned an average of 1.4 million 48 pound cases annually with approximately 150,000 cases produced from Alaskan salmon. The pack of Alaskan fish totalled 0.5 million cases in 1989 and 1990 combined. In peak Alaskan run years such as the last two years, more U.S. fish is processed in Canada.

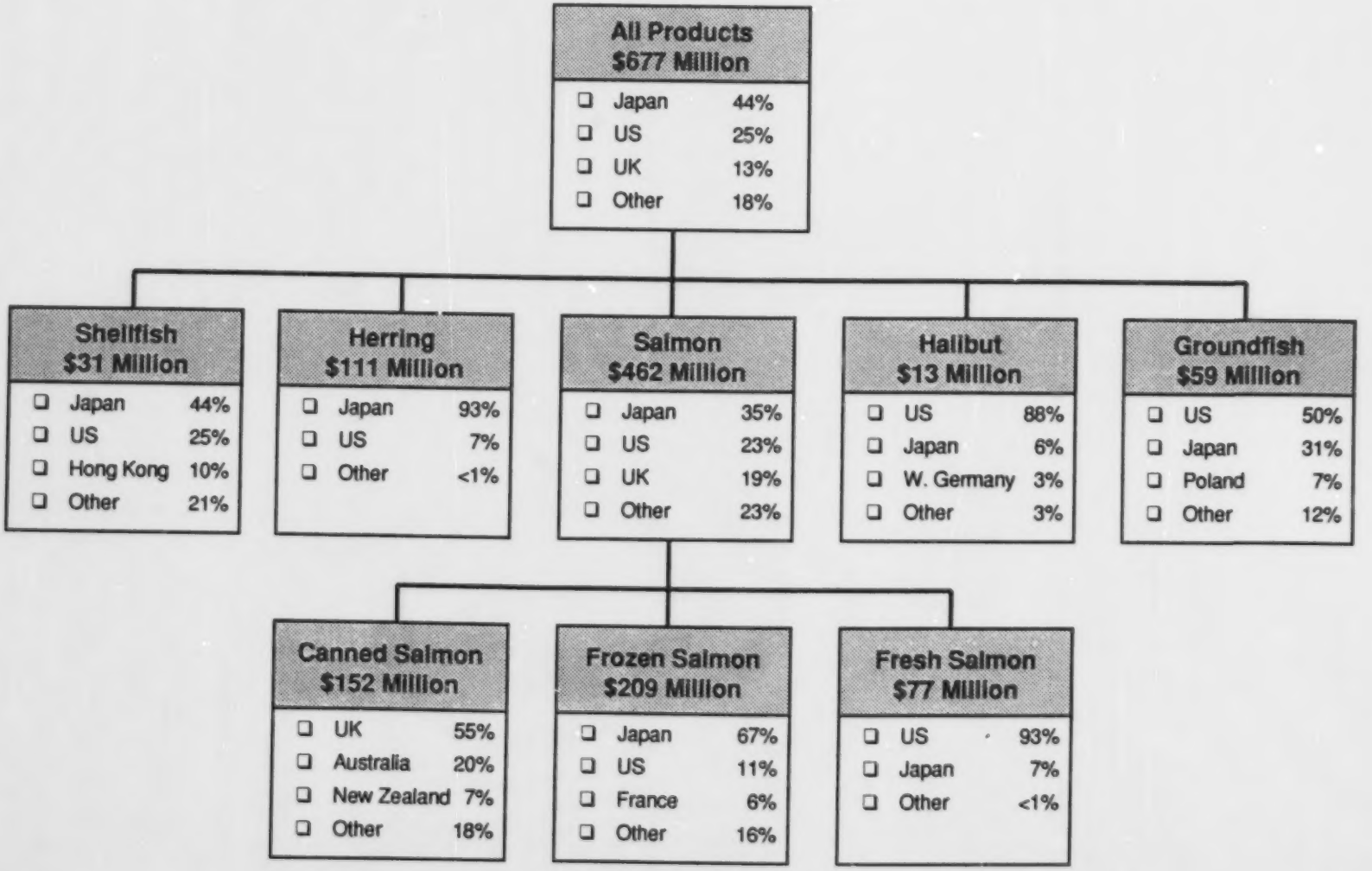
The can size mix of the pack varies from year to year. We suggest an average composition mix of 5-10% 1 lb talls, 65-70% 1/2 lb tins, and 20-25% 1/4 lb tins. Alaska, in contrast, cans almost no 1/4's with two-thirds of the pack comprising 1 lb talls. The remainder are mainly 1/2's.

The value above includes the value from processing imported salmon from Alaska, but excludes halibut, hake and other groundfish caught in Canadian waters but processed abroad (either in Washington State land-based plants or in foreign factory ships).

2.3 Markets

The industry is highly export-oriented. It exported $677 million or two thirds of its $1 billion production in 1989. Approximately half

Exhibit 2.3: Export Markets for BC Fish Products 1989



the salmon canned pack is sold within Canada in any given year. This suggests that the market share of 1989 industry sales was:

Domestic Canned salmon	17%
Domestic Other salmon & non-salmon	16%
Export Canned salmon	17%
Export Other salmon & non-salmon	50%
Total	**100%**

market specifications. These include the processing of salmon and herring roe, "Japanese cut" sablefish and "princess cut" sockeye salmon.

Foreign buyers of frozen chinook, coho and chum salmon process much of the whole product into smoked sides.

1989 Export Sales

Product	$Million	Major Buyers
Canned Salmon	152.2	UK, Australia, New Zealand, U.S.
Frozen Salmon	208.9	Japan, U.S., France, Italy, Sweden
Fresh Salmon	77.0	U.S., Japan
Salmon Roe	10.1	Japan, Germany, U.S.
Herring Roe	102.8	Japan
Herring Roe on Kelp	8.0	Japan
Halibut	13.2	U.S., Japan
Groundfish	58.7	U.S., Japan, Poland, USSR
Shellfish	30.8	Japan, U.S., Hong Kong

Over all products, Japan, the U.S. and the United Kingdom (UK) represented 82% of total exports from B.C. in 1989 (see Exhibit 2.3). The B.C. fish processing industry is largely dependent on three export markets.

Japan represents essentially the only market for certain products -- frozen sockeye salmon, herring roe, herring roe on kelp, sablefish, geoducks, sea urchins and sea cucumbers. Particular processing techniques have been developed in B.C. plants to meet Japanese

2.4 Number of Plants and Employment

Processing Plants. In 1988, there were 226 fish processing plants licensed by the Province -- 13 canning operations sometimes combined with cold storage, 118 cold storage plants, and 96 consisting of packing and other types of processing.

Nine of the thirteen canneries were operated by medium to large processors (the other four are

much smaller single line plants). Over 90% of canning capacity is concentrated in the Lower Mainland and Prince Rupert. The B.C. Packers cannery in Prince Rupert is the largest on the west coast (including Alaska), and is one of the largest and most modern in the world.

Freezing and cold storage facilities are more widely dispersed along the coast. The west coast of Vancouver Island is the landing location for much of the troll salmon catch, and has several freezing facilities.

Labour. Average monthly employment at fish processing plants in 1989 was an estimated 5,700. Of this total, 83% were hourly operating employees and the other 17% were administrative and supervisory personnel. Employment is highly seasonal. Peak employment of 9,850 occurred in August. December had the lowest employment level at 3,060.

Estimated employment by region in 1989 was:

	Person-Years
Lower Mainland	4,000
Vancouver Island	300
Central and North Coast	1,200
Other	200
	5,700

Natives comprise 24% of the industry labour force. The largest concentration is in Prince Rupert where the Native share is 58%.

2.5 Industry Structure

Most of B.C.'s fish products are processed by companies privately held and Canadian-owned. There is not the Japanese presence of ownership in large processors that Alaska has.

Key aspects of industry structure and conduct include -- concentration of buyers and sellers, entry and exit conditions, product differentiation and pricing behaviour. These areas are discussed briefly.

Industry Concentration. For most fisheries sectors the industry can be characterized as many fishermen-sellers transacting with few processor-buyers. B.C. processors generally sell their products to highly concentrated foreign buyers such as John West in the UK for canned salmon, and a limited number of Japanese trading houses for frozen salmon and herring roe.

There are 5,800 licensed fishing vessels in British Columbia with 4,500 licensed to fish salmon alone. The four major companies purchase and process two thirds of B.C.'s salmon and herring. The major processors share of seine caught salmon and herring purchases is higher at 80%. The majors had much smaller purchase shares of halibut (29%), groundfish (25%) and shellfish (1%) in 1990.

On the product side, the greatest area of concentration is canned salmon. The four majors produced over 80% of all canned salmon in 1989, but only 30% of total fresh/frozen salmon. The higher concentration in canning reflects, in part, the greater

Industry Concentration						
Salmon Purchases				Salmon Sales		
	Top 3 Firms 1976	Top 4 Firms 1990			Top 3 Firms 1976	Top 4 Firms 1989
Gillnet	58%	59%		Canned	82%	83%
Seine	63%	80%		Fresh/Frozen	48%	30%
Troll	44%	30%				
All	59%	63%		All	65%	59%

economies of scale in canning. Industry concentration ratios are given in Appendix D.

The four major companies produced 61% of the total value of herring products in 1989. There is much less concentration in the three broad product groups Halibut, Groundfish and Shellfish. The Top 4 firms, not necessarily the majors, represent at most half of industry sales in these categories.

Overall industry concentration of total salmon purchases and sales does not appear to have changed appreciably over the past 15 years (in fact, it may have decreased). However, the majors appear to have a higher share of seine purchases and a lower share of troll purchases and fresh/frozen sales today.

Note however, that high concentration ratios for certain species or products imply nothing by themselves, about the ability of the industry to control prices in either raw material or end-product markets. Industry control over prices is discussed at the end of this section.

Barriers to Entry and Exit. The main barrier to entry to the industry is a reliable supply of fish for processing. Fish are very perishable and, once caught, cannot be inventoried.

Capital costs for canning are high and as a result, a cannery requires a much higher volume of fish to break-even than does a freezing or fresh fish plant. The greater barriers to entry for canning are illustrated by the fact that healthy industry returns from canning in the mid to late 1980's did not result in start-up of new cannery operations. Even a major company like J.S. McMillan Fisheries continues to have its southern-caught canning quality fish custom canned rather than build a cannery in Vancouver. (J.S. McMillan has a cannery in Prince Rupert but none in Vancouver). Ocean Fisheries trucks fish from Prince Rupert to be canned in their Vancouver plant.

Exit from the canning industry is impeded by the very low variable cost portion of non-fish costs. In the short term, companies can stay in business even though they do not cover total long-term costs, as long as their variable costs are covered. The history of the industry is characterized by consolidation and take-overs of processing operations in financial trouble,

rather than outright sale to non-fish processing interests (especially if the seller has strong ties to raw fish supply).

Entry and exit for fresh, frozen and other operations is easier because of the lower capital costs, lower break-even volumes, and shorter start-up/wind-down periods. Also freezing plant and equipment can be more easily converted into other economic endeavours (e.g. processing fruits and vegetables) than can a cannery.

Product Differentiation. The industry has tried to differentiate its product in world markets mainly through quality. Better handling practices, in-plant control, workmanship and stricter federal government inspection standards have helped B.C. processors achieve a world-wide quality reputation. Government regulations, such as the restriction of exports of #2 quality frozen sockeye and pink salmon from Canada (since dismissed in 1989), have also favoured the production of quality products.

As a general rule, B.C. fish products are sold unbranded into domestic and world markets. The processor is not identified by the ultimate consumer. The exception to this rule is the domestic canned salmon market whereby the major canners label their product and sell directly to the grocery store chains. Canned salmon is sold unlabelled to the export market.

Vertical Integration. Backward integration to raw fish supply takes the form of: (1) ownership of fishing vessels and licences; and (2) ownership of salmon farms. The industry owns perhaps 150-200 fishing vessels, most of which are large salmon seine vessels. Fisheries and Oceans Canada has a policy of limiting the direct ownership of fishing vessels by processing companies. B.C. Packers owns several salmon farms. Several other processors have exclusive processing and/or marketing contracts with individual farms.

There is greater backward integration for canners than for companies specializing in the fresh/frozen trade. A secure supply of fish is critical to high volume canning operations.

Forward integration from processing activities occurs through an in-house marketing function for several companies. Other companies use brokers. B.C. Packers and the Canadian Fishing Company are controlled by companies with a strong presence in the Canadian retail grocery market.

Industry Associations and Bargaining. Processing industry associations are involved in the bargaining of minimum prices paid fishermen and of plant worker wages, terms and conditions. The four major companies comprise the Fish Processors Bargaining Association of B.C. (FPBA). The Fisheries Council of British Columbia (FCBC) involves seven processors, including all of the majors.

The fishermen's organization, United Fishermen and Allied Workers' Union (UFAWU) negotiates with the Bargaining Association on behalf of tendermen on packer and collector boats and shoreworkers in processing plants. The UFAWU also negotiates with the FPBA on minimum prices

for seine and gillnet-caught salmon and roe herring, and on salmon seine crew settlement shares. For troll-caught salmon and for species other than salmon and herring, fishermen negotiate price individually with buyers/processors.

In 1989, a 16-day strike by UFAWU members occurred at the height of the salmon season. The strike was resolved with the setting up of an independent Industrial Inquiry by the Province to arbitrate plant labour rates and terms.[1] A three year agreement on salmon minimum prices was settled.

A wide array of fisherman organizations exist representing individual interest groups, for example gillnetters, trollers, seiners, trawlers, etc. They do not, however, negotiate fish prices with processors. The Native Brotherhood represents the interests of native fishermen and some native shoreworkers. The FPBA negotiates and signs smaller contracts on fish prices and shoreworker wages with the Native Brotherhood.

Industry Influence Over Prices. The industry generally has little influence on the selling price of its products in world markets since it produces a small share of world trade in fish products. For example, British Columbia produces only 10% of world production of salmon.

There is a high degree of buyer concentration in export markets (e.g. John West for canned salmon). For this reason, as well as Canada's small share of world trade, B.C. processors generally are "price takers". They cannot pass cost increases forward to buyers (i.e., the industry is not a "cost plus" industry). Certain high quality niche markets exist, such as the Japanese herring roe and herring spawn on kelp markets, where Canadian processors may have some limited influence over prices.

Prices received by processors reflect several worldwide supply and demand factors -- landings in the current year (wild and cultured/farmed), inventory levels, exchange rates, general economic conditions, consumer tastes and the prices of substitutes. Exchange rate fluctuations are very important as B.C. exports are usually priced in the currency of the importing country or in U.S. dollars.

As noted earlier, the industry has tried diligently to differentiate its product based on quality. In the past, this earned it a small price premium over competitors such as Alaska, but this premium shrunk during the last two years with the world surplus of salmon. B.C. frozen sockeye salmon still earns a price premium in Japan.

The industry has greater control over the prices in the much smaller domestic market, especially for canned salmon. There is strong

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1 *The commission recently delivered its report: K.C. Mackenzie, Commissioner ;"Report of the Industrial Inquiry Commission: The Fish Processing Industry and the GATT Ruling", April 15, 1991.*

brand identification with retailers and consumers, and canned salmon imports are minimal. Domestic canned salmon prices are generally higher than export prices (costs are also higher due to labelling, warehousing and greater inventory costs). B.C. produces much more 1/4 lb tins of salmon than does Alaska, its chief canned salmon competitor. This gives the B.C. industry some market power when the demand for 1/4 lb tins is strong.

Payments for the raw material -- fish -- represent the largest cost item for processors. Raw material represents over 50% of the selling price of B.C. fish products. (See Section 3.3) The price paid to fishermen is a derived demand. That is, the price paid depends on the expected value of the final product. The ability to pay fishermen is derived from the sales price less the costs of labour, materials, energy, services, etc. and a normal cost or return on capital.

The "price" paid fishermen can include both the explicit cash payment plus a range of services such as pre-season advances, free moorage, ice and accounting, fly-in of emergency parts and use of net loft space. The major processors offer a full range of services, operate during the full salmon season (including late-fall terminal chum fisheries) and have buying stations and packing in remote locations along the coast. Smaller processors do not offer such services and generally pay a higher cash price for limited quantities of fish. The general benefit package to fishermen -- including both direct payments plus indirect benefits -- can be similar for small and large companies.

As noted earlier in this section, there is significant concentration of purchases of salmon and herring among four major processors -- the four represent over 60% of purchases. The fact that there are many fishermen sellers and concentration among a few processor buyers would suggest that the major processors could influence prices paid fishermen.

However, in actual practice the major processors have limited influence on the price paid fishermen. The price paid by processors is determined by competitive bidding on the grounds, which in turn is determined by market conditions. Prices paid by the majors are influenced by the prices paid by the medium and small companies. If the prices paid by the majors are not competitive, after incorporating an allowance for services provided, they will lose fishermen and raw material supply. In this sense, raw material prices are determined by buyers at the margin.[2]

In a falling market, downward flexibility in pricing by the majors is limited by the minimum price agreement for net-caught fish. The pricing of troll-caught salmon purchases,

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2 *Processors have greater control over prices paid fishermen for pink salmon than over prices for other species. The vast majority of the pink catch is canned. There is not the price competition for canning quality fish that exists for fish destined for the fresh/frozen market.*

including those of the majors, adjusts quickly to market changes.

In summary, the influence of B.C. fish processors on product prices is limited except for the canned salmon market in Canada and certain niche export markets. Their influence over fish prices is also limited, in spite of high concentration of purchases for some species, because of a competitive fringe of medium and small processors that "keeps the big guys honest".

3.0 THE FISH PROCESSING BUSINESS

The British Columbia fish processing industry can be characterized as a food manufacturer selling mostly to world markets. As a food manufacturer, it requires access to high quality, reasonably priced raw material and other inputs such as labour. As an exporter, it faces heavy competition, unpredictable exchange rate fluctuations, unpredictable tariffs and other risks in the world marketplace. As a resource-based industry, it is subject to swings both in internal factors such as catch volumes and prices and market prices, and in the general business cycle (interest rates, economic growth in major markets).

The industry is very cyclical. The returns for the good years must tide the industry over the poor years. The industry's capital structure must be able to accommodate these cycles.

These factors do not necessarily make the industry unique. There are several industry-specific considerations however that distinguish it from other resource processing sectors. An appreciation of the nature of the fish processing business, and the environment in which it operates, is central to the analysis in subsequent sections.

3.1 The Nature of the Business

The industry converts fish raw material into final and semi-processed products. It sells the processed product primarily to export markets. Exhibit 3.1 outlines the key activities in the value chain between raw material harvesting and final consumption.

The industry is resource constrained, and generally has no control over the annual supply of raw material. The catches are biologically determined. In the short term, higher prices will not elicit greater supply. In the long term, industry support for fisheries management initiatives such as the Salmon Enhancement Program (SEP), salmon stock rebuilding and other measures could affect supply. Inventorying raw, unprocessed fish between years in not practical due to perishability, cost, and market volatility concerns.

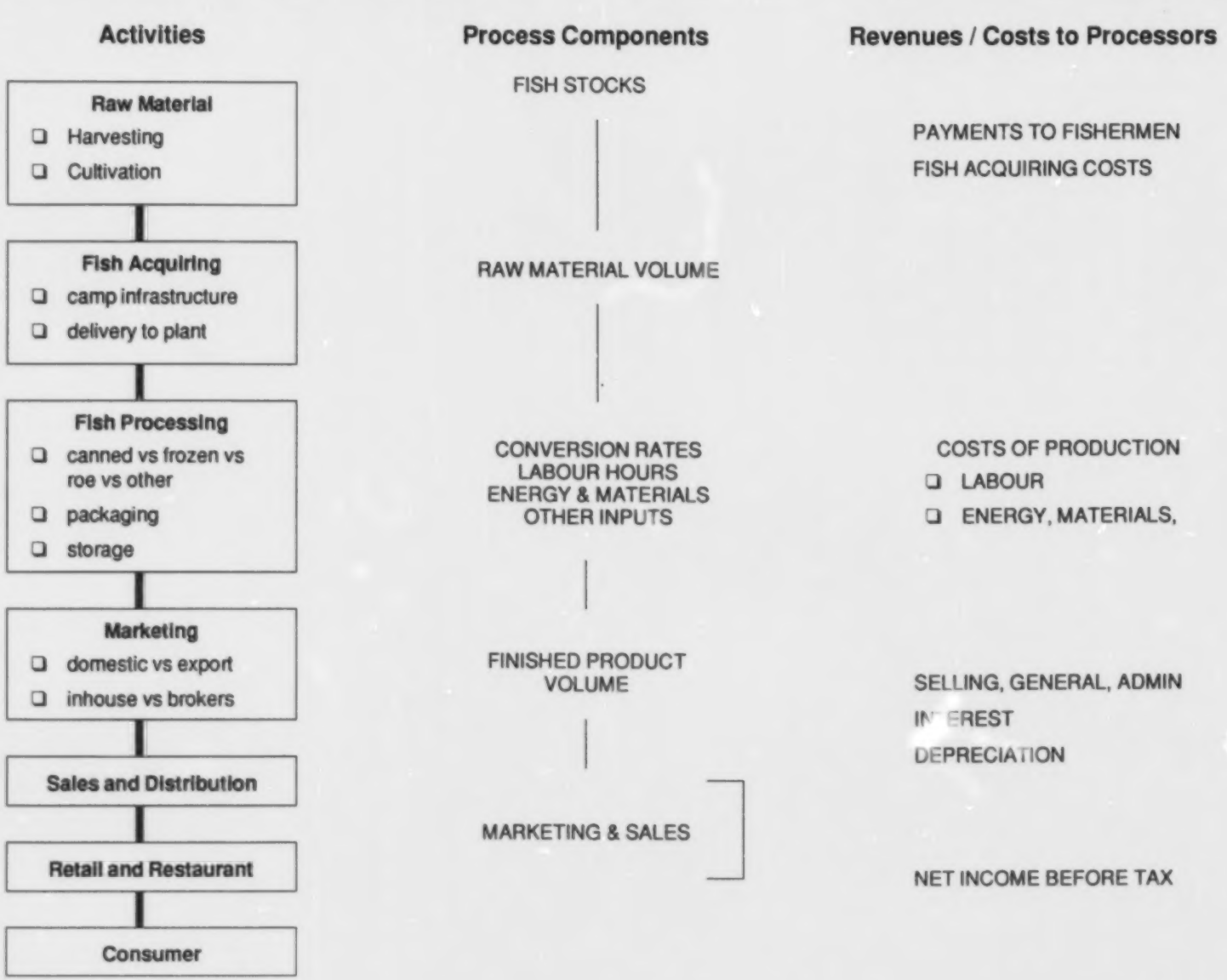
The industry does not have security of supply of raw material at a known price. It must competitively bid for fish each year.

The industry pays for the raw material before it knows what the market returns will be. It makes raw material purchase decisions based on market expectations that may or may not be realized.

Because of this a falling market, such as the 1990 salmon market, can be disastrous. The industry cannot adjust its raw fish prices downwards quickly enough. In a rising market, such as the 1988 salmon market, processors can always adjust prices to fishermen upwards after the season. Troll salmon prices and prices for other species react much more quickly to the market than do net-caught salmon prices.

The industry acquires and processes most raw material in a short period of time. This necessitates the carrying of large inventories for several products such as canned salmon. Unlike most other industries, the bulk of the

Exhibit 3.1: The Processing of Fish



industry's year-end Balance Sheet comprises current assets -- accounts receivable and inventories -- rather than fixed assets.

Because of the time between purchase of raw material and selling of end product, the industry requires large amounts of working capital to finance fish purchases and inventory. Interest rates critically affect the cost of "financing the pack". Cash flow is a major consideration.

The price of export products is denominated mainly in the currencies of the importer or in US dollars. Currency exchange rates therefore are critical.

Certain products and markets are very speculative. For example, Japan is the sole market for herring roe. There is usually a single inventory turnover once a year of the whole season's product.

The industry faces intense competition in world markets, not only from countries providing similar or competitive fish products, but also from other protein sources -- beef, pork and poultry.

In short the industry is resource-constrained, and highly speculative and competitive in both raw material and final product markets.

3.2 Philosophy and Investment Strategy

The behaviour and performance of the industry is guided not only by the above business environment considerations. Behaviour also reflects corporate goals, philosophy and investment strategy.

Corporate Philosophy and Goals.
Manufacturing industries generally have gross profit margin as well as return on investment (ROI) financial targets. The fish processing industry is somewhat different in that it has little control over market prices and over its main input cost, raw material. The large companies appear to focus on the target Return on Assets Employed, whereas the smaller companies apparently do not have explicit financial goals. Rather they operate on "rules of thumb".

The fish processing industry of British Columbia traditionally has been production-driven rather than market-driven. Firms have been preoccupied with securing and processing raw material during a short season. Relatively little emphasis has been directed to marketing and market research.

The industry is extremely volume conscious. A secure supply of fish is seen as very important, especially for large canners. The industry "buys fishermen" as a means of securing fish. Apart from competitive bidding for raw material, industry strategies include the provision of extensive fish-acquiring infrastructure, direct ownership of fishing vessels and licences, provision of services at no or low cost, etc.

The industry comprises a small share of world trade in most product lines. As a way of differentiating its products, the industry has attempted to do as much value-added

processing as possible in Canada, to produce a high quality product, to cultivate the domestic canned market through branding of product, and to can a substantial quantity of 1/4 lb tins of salmon. This is a different strategy than its main competitor Alaska follows.

These initiatives have reflected in large part an attempt at niche marketing to gain competitive advantage. However, BC processors have a pride in the quality and advanced processing of their product. In a real sense, several processors want to be known in the world marketplace as producing quality products, regardless of market signals.

In the past, the industry has felt an obligation to buy all fish made available, even if margins on certain products were negligible or negative. The philosophy has been that healthy margins on certain (mainly high-value) products should make up for slim margins on other products. In essence the industry subsidizes certain species and products.

Akin to fishermen, many individuals are attracted to the fish processing industry because of personal lifestyle considerations. These entrepreneurs like the "high risk, high reward" potential, the independence and the long term working relationships developed. As well, several families have been in the industry for generations.

Investment Behaviour. Traditionally investment in the industry was made in the environment of two key government regulations:

- the statutory requirement that all herring, sockeye and pink salmon had to be processed in Canada before it could be exported, and
- a policy of prohibition on mobile fish processors.

These regulations endowed security of raw material supply to land-based processors for key species.

This security of domestic supply has been jeopardized with the 1990 GATT (General Agreement on Trade and Tariffs) ruling. Henceforth the U.S. can have direct access to up to 25% of BC's salmon and herring. There are no restrictions on the amount of fish US buyers can access if the fish is landed at BC locations before export.[1]

The industry has sufficient processing capacity to handle peak runs of fish. This investment strategy, plus the seasonal nature of processing, has resulted in low capacity utilization in most months and in most years.

Industry firms, in particular the large canners, require a secure supply of raw material to

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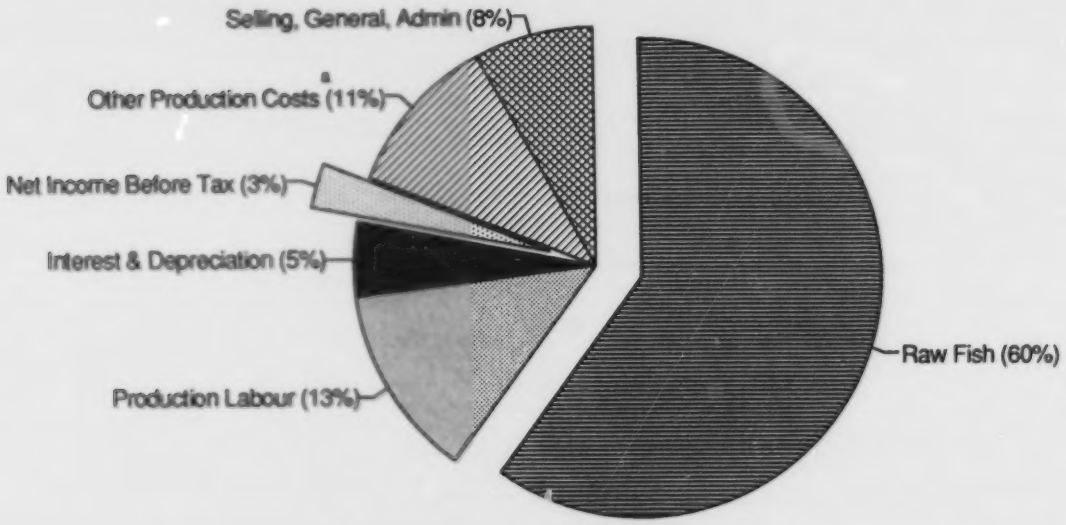
1 *Canada has placed Pacific roe herring on the export control list. Exports of roe herring to the United States are permitted only if the U.S. purchase is for domestic consumption or the herring will be processed within the U.S. prior to export to other countries.*

Exhibit 3.2: Cost Components of Sales Revenue for FPBA Companies, Averages for 1980-1989 Period



[a] Energy, materials, etc. plus change in value of year-end inventories.

Source: FPLA Submission to the Industrial Inquiry Commission

make investment with some security. The impetus behind much of the vertical integration of the industry has been to hedge risk on market share of the total available catch. The major companies have invested in fishing vessels and fishing licenses, and have purchased processing plants in Alaska. Several now are buying fish farms. The majors also have integrated forward through undertaking extensive in-house marketing.

At the opposite extreme are very small firms, such as truck buyers at public wharves, having no or little plant investment at all. They sell their product within 24 hours of purchase with minimal processing.

Different companies have vastly different cost

structures. The large canners will have a relatively large fixed component of non-fish costs, comprising SG&A (Selling, General, and Administration), Interest and Depreciation. The independent truck buyer, for example, will have very little fixed costs due to infinitesimal investment and 24 hour inventory turnover. The bulk of the industry in terms of numbers of firms as opposed to share of industry output, lies between these two extremes.

3.3 Recent Financial Performance

The B.C. fish processing industry experienced extreme fluctuations in fortunes and financial performance during the 1980s. The first half of the decade was a down cycle characterized by negative returns. This was followed by several years of fair to good returns. Preliminary reports suggest that 1990 and 1991 will be poor years.

The Fish Processing Association of B.C. (FPBA) companies submitted aggregate financial data to the Industrial Inquiry Commission. The four member companies represented approximately half of total fish processing industry sales, and 60% of industry sales of salmon and herring products in 1989. Financial data were not available for other companies.

FPBA companies realized the following average financial returns during the 1980s:

	1980-1984	1985-1989	1980-1989
Gross Profit to Sales	14%	17%	16%
After Tax Return on Equity	(3.2%)	11.8%	5.5%

These levels of return were less than industry targets of 18-19% gross margin and 15% after-tax return on equity[2]. FPBA companies did not achieve target returns even during the relative good 1985-1989 period.

The main cost to processors is the cost of raw material fish. In the 1980s fish purchases, including acquiring costs, comprised 60% of sales for FPBA companies (Exhibit 3.2). Production labour costs represented 13% of sales, or less then one quarter of raw fish costs.

The high cost of fish purchases appears to be a major impediment to improved financial performance of the industry. At the same time and as noted earlier, the industry has limited ability to control the price of fish purchases. A challenge to industry is to decrease the share of each sales dollar that goes to raw material purchases.

2 *These targets were suggested in the report: Clarkson Gordon, Survey of the British Columbia Fish Processing Industry: Financial Results 1978-1982, Canadian Industry Report of Fisheries and Aquatic Sciences No. 146, Department of Fisheries and Oceans, Ottawa, December 1983, pp.89-90.*

4.0 MARKET TRENDS

The British Columbia fish processing industry exists because there is a market for its products. Strong and healthy industries are those that can adapt or innovate when faced with market change. The markets for B.C.'s fish products have exhibited some long term trends as well as some fundamental changes.[1]

4.1 Supply, Demand, Consumption

The key market trend is increased competitiveness in world protein markets for seafood, as well as for other protein sources such as beef, pork and poultry. This has resulted from increases in supply of wild and aquacultured seafood products, aggressive marketing by seafood and non-seafood producers, and shifts in consumer tastes and attitudes.

World Seafood Supply Trends. Total world catches of seafood have increased substantially since 1979. Total catches increased from 71 million metric tons in 1979 to 98 million tonnes in 1989. The relative proportions for human consumption (71%) and industrial purposes (29%) stayed roughly the same during this period. Current salmon production of 1 million tonnes represents only 1% of the total world catch of seafood.

Some of the most dramatic shifts in seafood trends relate to salmon supply and consumption. There appears to be permanent changes in salmon markets from large increases in salmon supply in the late 1980's -- both from increased farmed salmon production and from increased wild salmon harvests.

World supplies of salmon have doubled since the mid-1970s (Exhibit 4.1). In Alaska and British Columbia, wild salmon harvests increased during the latter part of the 1980's. This in large part, has been due to the success of hatchery and other enhancement measures. Supply growth presently exceeds demand growth with resultant downward pressure on prices.

The share of farmed salmon in total salmon supply rose from 1% in 1979 to 30% in 1990. Norway is the largest producer of farmed salmon, followed by Scotland, Japan, Canada, Chile and the U.S. The British Columbia salmon fishery produces 10-15% of total wild salmon production, fourth behind the U.S., Japan and the U.S.S.R.

The world catch is processed into four main food products -- fresh, frozen, cured (including smoked) and canned. Fresh production showed the largest relative increase during the 1980's, while canned showed the largest decline. The ex-vessel value of seafood in real dollar terms has not increased over the period.

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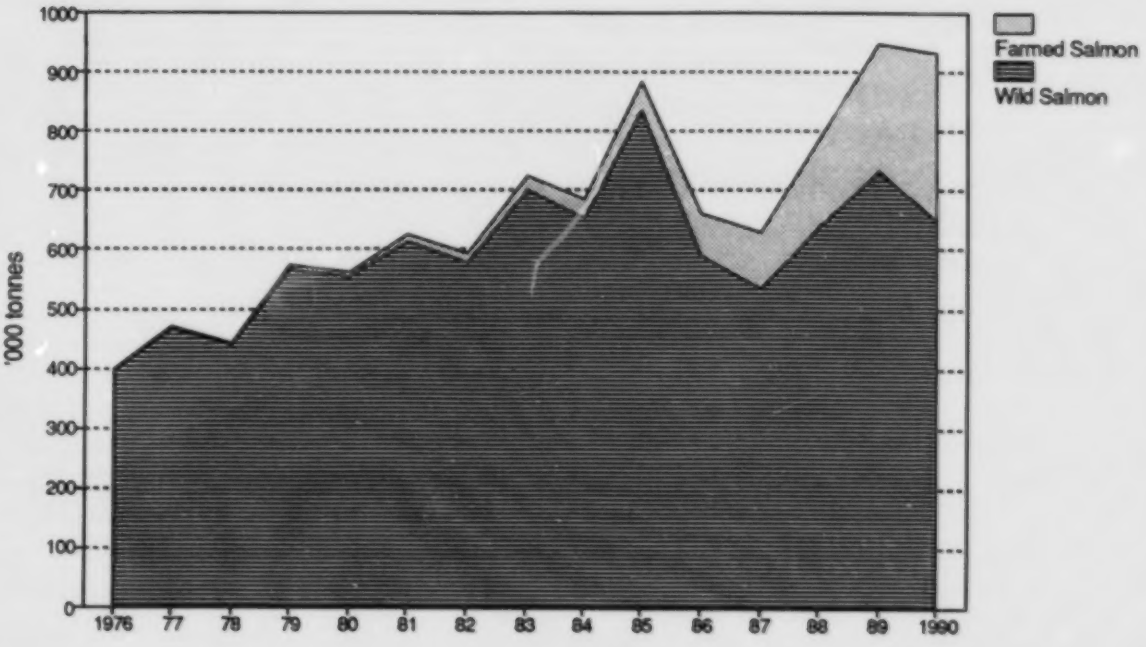
1 *For this study, Susan Shaw, University of Strathclyde, Glasglow, Scotland and Cathy Wessells, University of Rhode Island developed market profiles for the European Community and Japan respectively. The summary market analysis of this section for these regions is drawn largely from their work.*

Exhibit 4.1: World Salmon Production



Source: ASMI, Salmon 2000, March 1991.

	Share of Total Products	
Product Form	**1979**	**1988**
Fresh	25%	30%
Frozen	32%	33%
Cured	22%	20%
Canned	21%	17%
Total	100%	100%

Although farmed salmon is sold predominantly in fresh form, increasing amounts are being frozen or smoked.

World Supply Forecasts. Although total world catches have increased each year since 1979, world catches are expected to level off by the year 2000 according to FAO. Production increases from aquaculture however should continue.

The one-million-tonne annual salmon supply scenario is at hand. The current market situation is a world catch of 0.7 million tonnes wild salmon and 0.3 million tonnes farmed salmon. Depending on the economics of

farming, it is possible that farmed salmon production could double by the year 2000 with the wild salmon catch fluctuating around current levels. FAO forecasts that salmon supply (wild plus farmed) will exceed 1.3 million tonnes by the year 2000.

British Columbia salmon harvests could grow with enhancement and stock rebuilding of Fraser River stocks.

Several production forecasts have understated the dramatic worldwide growth in farmed production. Record harvests of wild salmon in 1989 and 1990 were in different ways unpredictable. However, it is believed by many that there are biological limits to which both farmed and wild salmon can expand.

Herring roe supplies are likely to show only gradual increases, with any increase likely from lower valued Atlantic herring. Groundfish supplies are not expected to increase. Shellfish stocks, in particular aquacultured shrimp production, should continue to increase. Tuna catches should level off.

Protein Consumption Trends. Seafood cannot be viewed in isolation from other protein products. B.C. fish products compete directly with other fish and seafood, as well as with other protein sources such as red meat and poultry. Seafood producers must respond to supply and marketing initiatives of producers of other protein sources.

Seafood consumption varies greatly by country (Exhibit 4.2). Per capita consumption in Japan is 32 kg. per year (edible weight) whereas North American consumption is under 8 kg. per year. Spain also has high per capita consumption. Japanese per capita consumption of red meat and poultry is only one sixth of North American consumption.

As a protein source, seafood has been steadily gaining ground in the last decade. Not surprisingly, seafood consumption has primarily increased in markets where beef has been the traditional protein source. For instance, fish and shellfish consumption in the United States increased by 38% from 1968 to 1988. In this same time period there have also been significant increases in poultry and turkey consumption followed by a slight decrease in beef consumption. A similar trend has occurred in Canada.

Changing health attitudes, increases in disposable income, an aging population, shrinking household size and an increase in the proportion of ethnic minorities are considered to be major factors in the North American increase in seafood consumption.

In Western Europe the same pattern has emerged, with increases in white meat and seafood consumption due to factors such as changing lifestyles and attitudes. Red meat consumption has decreased. The momentum of this trend, however, is not necessarily universal throughout Europe. The exceptions are Germany and France, where seafood consumption has still increased but red meat consumption has increased slightly also.

Exhibit 4.2: Per Capita Consumption of Protein Sources

	PER CAPITA CONSUMPTION (KG PER YEAR)					
	U.S.	Japan	U.K.	France	Spain	Canada
I TOTAL SEAFOOD	7.2	31.9	15.0	21.7	25.4	8.0
Fresh/Frozen Seafood	4.8	NA	NA	14.8	NA	6.1
Fresh/Frozen Salmon	0.3	2.4	0.3	1.1	0.2	0.4
Other	4.5			13.7		5.7
Canned Seafood	2.3	NA	NA	NA	NA	1.9
Canned Salmon	0.14	0.2				0.6
Canned Tuna	1.8	0.4				
Other	0.4					
Cured/ Other	0.1	NA	NA	NA	NA	<0.1
II TOTAL RED MEAT	50.6	10.6	58.2	36.5	49.3	67.6
III TOTAL POULTRY	27.3	3.8	16.0	21.3	21.9	28.7
IV TOTAL	85.1	46.3	89.2	79.5	96.6	104.3

Note: Data refers to various years 1985 to 1989 (edible weight)

In the U.K. there has been a similar increase in poultry consumption and decrease in red meat consumption. Seafood consumption has fluctuated, with a decline in the mid-1970's and an increase in the 1980's. An increased awareness of preparation techniques is considered to be a factor in this increase.

In the Japanese market the consumption trends of protein have been the reverse. There has been a clear trend towards red meat consumption with an increase in per capita consumption of 40% and a slight drop in seafood consumption since 1970. There has also been a large gain in consumption of chicken with an increase of 73% from 1970 to 1989.

Decreases in household size, and increases in the real disposable income are the most likely explanation for this change in Japan's protein consumption. A steady increase in pre-prepared food (especially breakfast cereals), eating out (which generally favours protein sources other than seafood) and "Western" type meals also have affected these emerging consumption patterns.

International Trade and Developments. World trade in seafood products has been increasing. Total international trade as a percentage of the total harvest increased from 30% in 1978 to 35% in 1988. Japan is the leading importer of fishery products in the world followed by the U.S. and France. Canada is the leading world exporter followed by the U.S.A. and Denmark. Canada is dependent on export markets and is thus affected by international trade policy.

New trading partnerships in Europe will be established under the 1992 restructuring of the Economic Community. Canada will need to provide "guarantees" to enable its inspection system to be deemed "equivalent" by EC authorities. It appears that Canada should have little difficulty in satisfying new EC fish inspection standards.

The fishing industries in Eastern Europe (the former East Germany, Poland, Bulgaria, Romania and the Soviet Union) are facing the transition from a controlled system with fixed prices and extensive subsidies, to the rigours of the free market economy. One would expect some reduction in supplies from domestic fleets, at least in the early and mid 1990's.

This shortfall does not necessarily translate into an opportunity for B.C. processors. Eastern European countries face chronic problems of inconvertible currencies. It seems unlikely that fish or fish products would be seen as a priority use for foreign exchange.

Another barrier is the inefficient distribution system which could hinder trade in high quality, perishable products. Some opportunity may exist for canned salmon, if it formed part of a barter deal and the deal was for relatively low quality product at very low prices.

4.2 Market Opportunities and Constraints

Canada's food processing industry has often been described as antiquated and commodity-based, rather than market-based. This is changing as some traditional meat

packing companies have expanded product lines to include value-added poultry products. There also is an increased focus on brand identification.

Protein markets including seafood markets are increasingly competitive. The British Columbia fish processing industry needs to become more market-based to tap available opportunities. B.C. processors recently have introduced some product innovations such as low salt and boneless-skinless canned salmon. However, the industry still is largely production-oriented.

The increasingly competitive marketplace suggests that greater emphasis on marketing by B.C. fish processors would be prudent. Markets are driven by end-consumer needs and perceptions. Demographic trends in North America include a decreasing household size, more two-income families, and the growing importance of minorities or ethnic markets. These trends as well as increased income, age and education auger well for growth in per capita seafood consumption. North American population growth should also expand overall seafood consumption.

Available market research in North America and abroad suggests the following consumer perceptions:

- fresh fish is preferred to frozen fish
- seafood is considered expensive, relative to beef, pork and poultry
- the consumer requires greater variety of convenience products (microwaves do a better job at cooking fish than most other foods)
- many people will eat fish at a restaurant but will not cook fish at home
- consumers generally are not knowledgeable about fish and fish preparation techniques (fish is not viewed as a "safe" product to prepare at home)
- there is increased concern over the health aspects of diet
- there is increased concern over pollution of the world's oceans and lakes
- there is concern over the lack of inspection and grading of fish (including lack of quality stickers and date stamping of portions)
- most consumers perceive no difference between wild and farmed salmon
- consumers are willing to pay a significant price premium for increased freshness and year-round availability of fresh seafood.

The fish processing industry cannot meet the needs of consumers directly. Handling, processing and pricing practices of wholesalers and retailers downstream of the fish processor greatly affect the attractiveness of B.C. fish products to the ultimate consumer. For example, a retailer's shelf life policy affects the freshness of "fresh" product. Pricing policy is critical. It appears that the full savings from

declining wholesale prices for fresh/frozen salmon in 1989 were not passed on to customers in U.S. supermarkets and fish stores. Rather, distribution margins increased.

B.C. fish processors then have not only to know the needs of the ultimate consumer but also must work closely with their direct customer, the seafood wholesaler.

The major markets for British Columbia's seafood products are Japan, the United States, the domestic market and EC countries. The major products are canned salmon, fresh and frozen salmon, and herring roe. We briefly assess these main markets and products.

Fresh Salmon. With the advent of salmon farming, producers have the opportunity to supply fresh salmon at a consistent quality year-round. The year-round availability of farmed salmon could lead to increased consumer acceptance and familiarity of all fresh and frozen salmon.

To date, the U.S. has been the major target for this product. Canadian producers have a competitive advantage over Alaska in supplying the American market with a fresh product simply due to logistics. Moreover, Canada has a salmon farming industry; Alaska does not. Since 1989, Canada has taken over from Norway as the leading foreign supplier of fresh salmon to the U.S.

The North American market is considered to be immature, and has the potential for expansion. An indication of this is the introduction of fresh fish counters in supermarkets. Increases in real income, an aging and more educated population and health concerns are factors that most likely will enhance future North American fresh salmon consumption. (Several other factors could possibly contribute towards dampening this demand. These include concerns about pollution of fish and seafood, high prices, recessionary pressures and the response of competing protein producers).

As demand increases exports of fresh salmon to the U.S. are expected to continue to increase, especially from Canada and Chile. As competition in more distant international markets intensifies, chinook and coho from the conventional Alaskan fishery may increasingly be directed at the U.S. market.

Fresh salmon prices received by processors have fallen from the peak in 1988. A recent ruling in the U.S. by the International Trade Commission should result in higher prices for fresh farmed salmon in the U.S. market.

The Commission ruled that Norwegian salmon imports were being unfairly subsidized. A tariff averaging about 26% has been imposed on Norwegian imports of farmed Atlantic salmon. The main beneficiaries would appear to be the salmon farming industries in Canada and Chile. The tariff is also expected to result in an increase in exports of frozen Norwegian salmon to the U.S.

In contrast to North America, in Japan the fresh salmon market is well established. It is a familiar good that is generally consumed at home for breakfast and lunch. Other protein

sources are usually consumed at the restaurant level, as seafood is considered to be a staple consumed in the home.

An exception to this is Norwegian fresh salmon imports that are virtually all sold in restaurants. This dramatic change in Japanese attitudes towards restaurant consumption of salmon is due to Norway's aggressive marketing in this area.

One of the reasons salmon is so popular in Japan is that it is available in portions, making it easier and faster to prepare. This is particularly important to the increasing number of women entering the workforce who still prepare family meals.

In summary, fresh salmon demand should increase. The U.S. market, particularly the Western U.S. for logistical reasons, is the major opportunity for expansion by B.C. processors. The wild industry can supply fresh salmon for only limited periods. There is no such constraint for farmed salmon. However, risks at the production end of salmon farming are currently high.

The ability of B.C. processors to supply retail chains and restaurants directly is limited. These outlets rely on wholesalers to supply a variety of fresh seafood. For this reason, wholesalers are difficult to bypass.

Frozen Salmon. Japan is the largest frozen salmon importer in the world. Sockeye is the most preferred and important salmon species. The world price for frozen sockeye is driven by the Japanese market.

The Japanese are very quality conscious, not only for seafood but also for other food products such as apples, cherries and pork. Quality refers not only to taste. Visual aesthetics are very important ("the Japanese eat with their eyes").

Troll caught frozen-at-sea (FAS) Canadian sockeye receives a premium price in the Japanese market. This is due largely to high quality of the fish, the fat content, flesh colour, superior handling and in-plant control, and Canadian inspection standards. In late 1990 the price for U.S. Bristol Bay net-caught sockeye in the Tokyo wholesale market was 30% less than the price for Canadian FAS sockeye.

In Western Europe and the United States the major market for frozen salmon is for smoking and other reprocessing which requires a high quality product. The 15% tariff imposed by EC countries on smoked salmon imports is a major impediment to the export of smoked salmon by North American processors (see Section 5.2).

In the short term, high inventories in Japan should exert downward pressure on prices. In the long term, frozen salmon demand could increase if the high quality of frozen salmon could be promoted to consumers i.e. the "freshness is frozen in". Long term demand then should increase somewhat, particularly sales to smokers. Japan still appears willing to pay a premium for quality Canadian product.

Canned Salmon. The world canned salmon market is well-established. Canned salmon has

been traded in world markets for over 100 years. Alaska and British Columbia provide the bulk of world supply. Canada has a dominant position in world trade in 1/4 lb tins.

The major markets for canned salmon are North America and the UK. Distribution is primarily through the retail sector with canned tuna as its major competitor. For the UK the major buyer is John West with Princes second in importance.

The UK and Canadian markets are generally mature. In the U.S., the canned tuna market is considered more developed than the canned salmon market. In Canada the opposite is considered true (see per capita consumption figures of Exhibit 4.2).

There is a difference in market focus between the two countries. In Canada, canned salmon is mainly directed at the retail market. In the U.S., canned salmon is aimed more at institutional sales.

The United States food industry is large, complex and efficient. Typically, market entry costs for the retail sector are very high. Canned seafood markets are dominated by large food companies with canned brands such as Bumble Bee and Carnation. These food companies typically are not integrated with fish processing companies. As a result, there is little incentive for the larger food companies with lines of branded products to promote salmon generically.

Consumption of canned salmon can fluctuate dramatically with price changes. In 1989, U.S. and UK canned salmon consumption rose at least 25% over 1988 consumption primarily due to a substantial drop in prices.

Present canned salmon inventories are very high (see U.S. inventory data in Appendix C). Both Alaska and B.C. expect large packs in 1991. These considerations suggest lower prices in the short run. In the absence of major promotional efforts, price will be the major consideration in moving product in the next year or two.

The conclusion is that long-term demand for Canadian canned salmon will be relatively stable. There is some potential for increased growth in the retail sector of the U.S. market.

Smoked Salmon. The U.S. is the major market for B.C. smoked salmon. U.S. per capita consumption of smoked salmon is much lower than European or Japanese consumption levels. This suggests that greater sales to the U.S. represents an opportunity for B.C. smokers. The removal under the FTA of the 5% tariff on smoked salmon imported into the U.S. is advantageous.

Market prospects in Europe are not promising. As noted earlier, the 15% European tariff barrier is a major impediment. There also are literally hundreds of different kinds of "smokes" tailored to the nuances of each regional market.

An increasing share of British Columbia farmed salmon could be sold as smoked product. This trend has occurred for Norwegian and Scottish farmed salmon.

Herring Roe. Virtually all of the world's herring roe is consumed in Japan. There are two main products -- salted roe and flavoured roe (with soy sauce and hot spicy flavourings).

The general consumption pattern for salted herring roe has not really changed over the past several years. The consumer buys salted roe either for a gift or for home consumption, particularly during the New Year's holidays. This market appears to be fairly stable and mature.

Three factors seem to inhibit future growth in the consumption of salted roe. First, consumers perceive salted roe to be a once-a-year type of product, namely New Year's. Second, it is not a convenience product. Proper preparation takes time and experience. Finally, as in Western societies, salt intake is a growing health concern in Japan as well.

Flavoured herring roe offers the consumer three qualities which are increasingly in demand -- good quality, convenience and appetizing products. Significantly, steady sales occur throughout the year. Demand seems to be increasing.

The major sources of herring roe are Canada, the U.S. and Europe, with differentiations between Atlantic and Pacific herring roe. Total supply of herring roe is roughly evenly split between Pacific and Atlantic roe. However, it has only been in the last decade that imports of Atlantic herring roe have grown to these proportions. The growth in demand for flavoured herring roe spurred the increase in imports. Essentially all of the B.C. product is salted roe.

Prices paid for Canadian roe are substantially higher than those paid for Bristol Bay Alaskan roe, even though the sizes are labelled the same. This is largely due to grade differences, where the Canadian herring roe is of a higher grade.

Much of the roe herring from Alaska is shipped as whole herring from Alaska. The roe is stripped in processing facilities in China or South Korea, then shipped to Japan. As a result, the qualities which result in a high grade (mature, round, firm and unbroken roe) are generally lacking in Alaska herring roe.

The herring roe-on-kelp market is differentiated from other herring roe in that the value is heavily dependent on area of origin, thickness and evenness of the roe and the type of kelp on which the roe is attached. In general, British Columbia roe-on-kelp is highly regarded. The expansion potential of this market warrants further research.

In summary, the Japanese market for salted herring roe (the outlet for the bulk of the B.C. product) appears flat. The flavoured herring roe market, which does not require the high quality of the B.C. product, is likely to show growth.

Value-Added Processing (all species). The most favourable route for B.C. processors to tap consumer demand for convenience products, such as prepackaged portions and microwave products, is to forge an alliance

with a major food distributor. Product launch costs of brand development, advertising and "slotting" shelf space for a B.C. processor to enter the retail market would be very large.

A constraint to increased value-added processing is the high cost of fish raw material. To compete effectively with other protein and fish products, the raw material costs must be relatively low since the costs of processing, packaging and distribution are relatively high. With the higher value salmon species then the value-added opportunities are likely limited to portion controlled packs, with or without low-cost additives such as sauces and marinades. British Columbia also has hake and dogfish which is underutilized, and which potentially could be developed for value-added products.

For BC processors to maintain existing markets and to tap the new market opportunities identified in this section, the industry will have to become much more market-oriented.

5.0 THE INFLUENCE OF GOVERNMENT

Government programs and regulations both in Canada and abroad affect the performance of the B.C. industry. We analyze the influence of several government programs directly related to the fish processing sector. We also address the repercussions of general government macroeconomic policy in terms of interest rates, corporate and personal tax rates and other areas.

5.1 Directly Related Programs

Inspection Regulations. Canada has a mandatory inspection program governing the processing of fish products destined for export markets. The standards are high, and relate to health and safety as well as fish quality concerns. Processing plants are inspected as to compliance with construction, equipment, operations, process control and sanitary criteria.

The inspection standards increase costs to Canadian industry. They also have benefit in terms of buyer confidence and potentially higher prices.

In the U.S. there is no mandatory seafood inspection program. State regulations and upgrading of U.S. processing operations appear to be improving. Nevertheless, U.S. processors have a strict cost advantage over their Canadian counterparts due to less onerous regulations.

From the late 1970's to the 1989 GATT ruling, Canada had a regulation prohibiting the export of sockeye and pink salmon unless it was canned or frozen #1 grade. Lesser grades of frozen product and fresh product could not be exported. This tended to improve handling of freezer grade fish in the plant, but eliminated Canada from certain export markets.

The removal of these quality restrictions was a significant advantage to major processors during the 1989 strike. The majors sent raw salmon to Washington plants for freezing. After the strike was settled, most of this frozen product was imported into the province for canning. This could not have happened pre-1989.

Government Assistance Programs. Canadian, U.S. and other governments have assistance programs for manufacturers, including seafood processors. An important difference in assistance levels among nations appears to be in the area of generic promotion. Other countries competing with B.C. in world salmon markets have large generic promotion budgets funded by government.

1989 Generic Promotion Budget

Norway	$12.3 million U.S.
Alaska	$10.6 million U.S.
Scotland	$ 6.0 million U.S.
Chile	$ 1.5 million U.S.

There is significant U.S. state and federal government funding of promotional activities of the Alaska Seafood Marketing Institute (ASMI). The budget of ASMI will increase from $10 million U.S. in 1990 to $14 million U.S. in 1991 with all of the increase coming from increased federal contributions. ASMI

Funding Sources	ASMI Budget ($ millions U.S.)		
	1989	1990	1991
State Funds	$2.1	$2.2	$2.2
Industry Funds	3.3	3.2	3.2
Federal Funds	5.2	4.5	8.8
Total	10.6	9.9	14.2

was created in 1981 with the mandate to market seafood aggressively.

B.C. processors report that they are losing longstanding salmon clients because ASMI is funding direct advertising and promotion of foreign buyers if they "buy Alaska first". ASMI also undertakes other promotion activities in domestic and export markets. This represents a distinct advantage to the Alaskan seafood producer in today's competitive environment.

Resource Taxes. B.C. fish processors do not pay direct resource taxes. In Alaska processors pay the following shares of raw material costs as a Fisheries Business Tax to the State:

- 4-1/2% for canned fish;
- 3% for fresh frozen fish processed in shore-based facilities;
- 5% for fish going to floating processors; and
- 1% for under-utilized species (mainly groundfish).

The State of Alaska evenly splits these tax revenues with the communities in which the processing occurs.

The lack of processing-based resource taxes in B.C. is an advantage to domestic processors.

Resource Management. The processing industry needs a healthy fish stock to provide a long term fish supply for its operations. Canada has a world reputation for its high quality research and management of the fish resources of the Pacific Ocean. These management endeavours have been directed at both wild and enhanced stocks of salmon and at other species. Resource management practices have encouraged the startup of several fisheries such as roe herring and herring spawn on kelp. The fish resources of British Columbia have been managed to provide close to their maximum value in world markets.

Canada also has forged joint management initiatives with the U.S. on several fronts -- the 1985 Canada:U.S. Salmon Treaty, the International Pacific Salmon Commission and the International Halibut Commission.

We have no detailed knowledge on management practices of the Alaskan fishery. However, we note the following:

- unlike B.C., Alaska has only a minor troll fishery to harvest high quality salmon;
- more Alaskan fish is caught in terminal fisheries (e.g., chum);
- over or under escapement of salmon spawning stocks appear to occur more often;
- the harvest appears to be less orderly in Alaska (e.g., witness the frenzy of the Bristol Bay gillnet fishery).

To be fair, there could be population, location, resource-specific and other factors impinging on Alaska management practice. In addition, Alaska has only relatively recently achieved statehood and the associated management rights to its fish resources.

Nevertheless, British Columbia appears to have an advantage in resource management.

Fleet Management. Fleet management, as opposed to resource management, refers to the process of limited access to the fishery (if any), gear restrictions and other conditions concerning capture. It also refers to enhancing the net social and economic benefits of the valuable fish resources.

Canada Fisheries and Oceans (DFO) pioneered the limited entry of large scale fisheries with the limited entry program for salmon vessels of 1969. However, DFO has been unable to control effectively the catching power of the fleet. The fisheries resource is regarded as a common property that can be harvested by any licensed fishermen. Only after the fish are caught do they become private property. The result is that fishermen invest heavily in boats and equipment in their competitve drive to catch a greater share of the available harvest. Although this is a rational investment decision for the individual fishermen, collectively this behaviour results in overcapacity and excessive costs for the fleet as a whole.

B.C. processors note that many fishermen need high catches and high prices to support debt service and other cash flow obligations. This puts pressure on the processing industry to raise prices paid fishermen above those dictated by market signals.

Alaska catches three to four times as much salmon as B.C. but only has twice as many vessels. Moreover, the average capital investment per vessel is much lower. There is not the same pressure on Alaskan processors to provide high prices. This is a benefit to the Alaska industry.

5.2 Macroeconomic Factors and Government Policies

Canadian monetary and fiscal policies affect the competitiveness of the B.C. fish processing sector.

Interest Rates. Over the 1986 to 1990 period, the prime lending rate in Canada averaged 2.5 percentage points higher than the U.S. rate. The difference has been increasing with the

1990 difference in rates approaching 5 percentage points.

The high Canadian interest rates have been detrimental to B.C. fish processors through raising interest costs on working capital and long term debt. They also may have discouraged B.C. processors from undertaking needed capital investments.

We conclude that the higher interest rates in Canada represent a disadvantage relative to U.S. processors.

Corporate and Personal Tax Rates. Corporate tax rates for manufacturers in the U.S. and British Columbia generally are similar under tax reform (tax rates for non-manufacturing industries are higher in Canada). However, the U.S. appears to have a broader corporate tax base (i.e., depreciation rates, investment tax credits, etc.), and therefore firms operating in the U.S. have an advantage in lower effective taxation rates per investment dollar.

Personal income tax rates are higher in Canada than in the U.S.[1] This affects the ability of Canadian processors to attract workers at wage rates comparable to the U.S.

Note that Canada's social programs such as health care and social security are funded from general tax revenues. In the U.S. funding is derived directly from payroll taxes or premiums levied directly on employers or workers. Canada requires higher personal and corporate taxes to pay for the social programs of its population, and this requirement raises the cost structure of business.

One taxation policy exists that hurts the competitiveness of the province's major processors vis a vis certain other processors. Indian fish processing corporations and their workers pay no income taxes if the plant is located on Indian land. This is a huge disadvantage to the majors and other non-Indian processors.

Exchange Rates. Exchange rate movements are critical to the fortunes of the B.C. fish processing industry since the bulk of production is exported, and because the transaction price is often denominated in U.S. dollars or the currency of the importing country.

U.S. processors have less currency risk than B.C. processors because their costs and their revenues in large part are both denominated in U.S. dollars.

Exhibit 5.1 displays movements in the value of the U.S. dollar and the Japanese yen over the 1980's. To 1986 for the U.S. dollar and 1988 for the Japanese yen, the Canadian dollar fell

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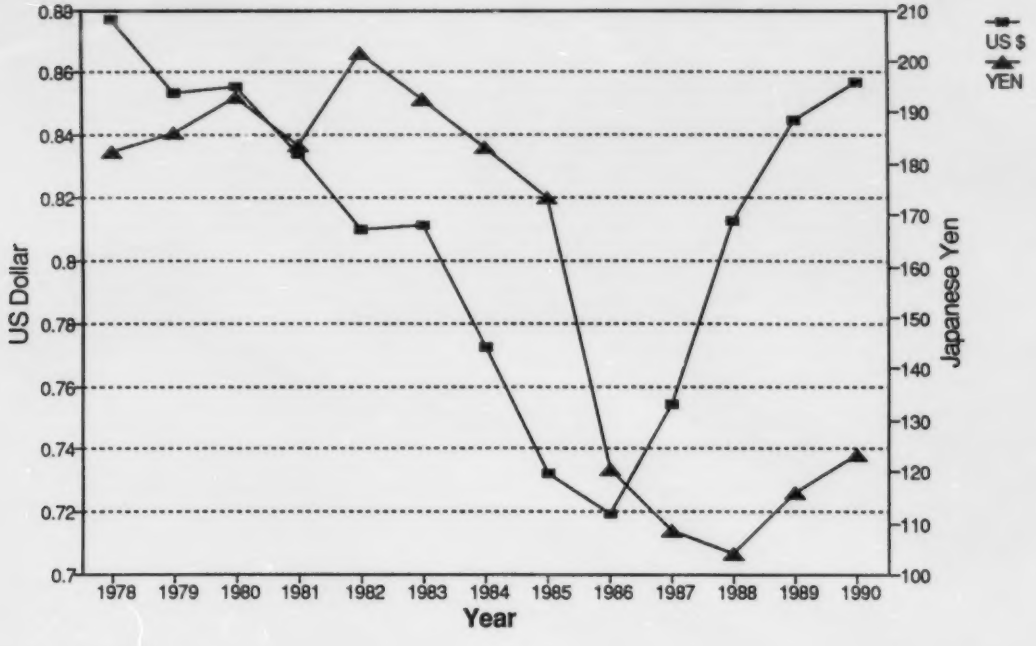
1 *Federal income tax rates are similar in the two countries. However, provincial personal income tax rates are much higher than state tax rates.* *Factors Contributing to a Competitive Agri-Food Sector: Appendices, Task Force on Competitiveness in the Agri-Food Industry and Agriculture Canada, June 1990.*

Exhibit 5.1: Exchange Rate Movements



Source: Bank of Canada, February 1991.

to the benefit of B.C. processors. Since these dates the Canadian dollar has strengthened against the two currencies, to the detriment of BC processors. (See Appendix D for exchange rate movements of other currencies).

The strong dollar has hurt Canadian exporters including BC fish processors.

The Goods and Services Tax. B.C. fish processors should benefit from the January 1, 1990 imposition of the federal Goods and Services Tax (GST). Prior to 1990 the cost of many items used in fish processing embodied an indirect or hidden tax (e.g., construction materials, office furniture and equipment).

Fish processors do not collect the GST on sales (they are "zero-rated"), but now can claim a credit on input purchases. The lower tax burden on input purchases should improve the ability of Canadian processors to compete in foreign markets.

We do not consider this an "advantage" for B.C. processors. Rather a disadvantage under the old system has been removed.

Foreign Tariffs. Many countries have tariffs on imported seafood. Under the Free Trade Agreement (FTA) with the U.S., tariffs on both sides of the border will be eliminated by 1992.

The tariff structure in certain key export markets is:

There are substantial tariffs on smoked salmon in Europe and on herring products in Japan. The smoked salmon tariff of 15% is a major barrier to penetration of the European market.

Canadian tariffs on imports pre FTA were: 3% prepared or preserved salmon, zero on other salmon and 5% on herring roe. The U.S. and Canadian tariff structures are similar.

Recently, the U.S. government has blocked or impeded the entry of smoked salmon from Canada into the country because of an alleged lysteria problem. It does not appear that the U.S. government is inspecting and regulating U.S. domestic smoked salmon production to the same standards. Canadian processors view this divergence in standards as a trade barrier.

The advantages and disadvantages of U.S. and Canadian government policies on the competitive position of B.C. processors are incorporated in Exhibit 6.4 of Section 6.0 following.

Foreign Tariffs on Imports

	EC	US Pre FTA	Australia	Japan
Canned Salmon	5.5%	3%		
Frozen Salmon	2.0%		prohibited	3%
Smoked Salmon	15.0%	5%	restricted	
Salmon Roe				5%
Herring Roe in Brine				12%
Frozen Herring Roe				6%
Frozen Whole Herring				6%

6.0 INDUSTRY STRENGTHS AND WEAKNESSES

Competitiveness can be considered as the long term ability to profitably gain and maintain market share. For an export-oriented food manufacturing industry, long term competitiveness depends on the comparability with competitors of input costs and quality -- raw material, labour, materials, energy, interest rates, etc. Competitiveness also depends on product differentiation, niche marketing, and the ability/will to innovate when economic circumstances change.

Competitiveness works at two levels -- first competitiveness between firms within the B.C. fish processing industry and secondly, competitiveness of the B.C. industry within the world industry. Member firms of the domestic industry must be competitive with one another, and with rival firms in other countries.

In this section we compare advantages and disadvantages of the B.C. fish processing sector with its main current rival, Alaska, and its potential rival, Washington State. In addition, strengths and weaknesses within the B.C. industry are highlighted. The analysis is segmented under broad headings of raw material, labour, other factor inputs, and demand.

Raw Material

1. Quality of Raw Materials
2. Economies of Scale/Harvest Volumes
3. Handling Practices by Fishermen
4. Harvest Location
5. Timing of Harvests
6. Raw Fish Prices
7. Additional Price Burden
8. Fish Acquiring Costs

Labour

9. Labour Costs (direct plus payroll burden)
10. Productivity
11. Access to Skilled Labour
12. Additional Labour Costs

Other Factor Inputs

13. Transportation to Markets
14. Energy Costs
15. Materials Delivered to Plant

Demand

16. Product Quality/Reputation
17. Branding of Canned Salmon
18. Size of the National Market
19. Niche Marketing

Competitiveness obviously varies by product type, processor location and a myriad of other considerations. The analysis of international competitiveness is clouded by the fact that regional differences in processing costs within Alaska may be greater than cost differences between Alaska and B.C. We adopt a "big picture" view in the analysis of competitiveness factors, and focus mainly on salmon.

6.1 Raw Material

Quality of Raw Materials. With few exceptions there are no inherent differences in quality between Alaskan and B.C. salmon. Bristol Bay sockeye, however, which comprise

one-half the Alaskan sockeye harvest, have a lower oil content and a paler flesh colour than B.C. sockeye, and accordingly are less valuable. Alaskan chinook salmon, in contrast, generally are more valuable than B.C. chinook because they are larger and have a more consistent red flesh colour, i.e., less marbled or white flesh.

The sockeye fishery is much more important economically than the chinook fishery. We conclude, therefore, that on balance B.C. has an advantage in the inherent quality of salmon raw material.

Economies of Scale/ Harvest Volumes. The U.S. produces much more salmon than British Columbia. Over the 1981 to 1990 period, annual salmon harvests averaged 82,000 tonnes in B.C., 280,000 tonnes in Alaska (greater than three times B.C. production), and 25,000 tonnes from Washington, Oregon and California combined. In both B.C. and Alaska, production in the latter half of the decade exceeded production in the first half. British Columbia harvests relatively fewer sockeye and pinks, and relatively more coho, chum and chinook than Alaska does (see Exhibit 6.1).

This much larger harvest confers, in theory, some potential benefits to Alaska processors if significant untapped economies of scale exist in fish processing. We have seen no evidence of this in processing operations per se. Plants in Alaska are no larger than plants in B.C. and do not have greater throughput volumes. In fact, the B.C. Packers cannery in Prince Rupert is larger than any cannery in Alaska. There may be some advantages in selling, general and administration costs to large Alaskan processors through the dilution of fixed costs through larger company (not plant) throughput.

We suggest that the much larger harvest volumes in Alaska do not represent an advantage, by themselves, to Alaskan processors.

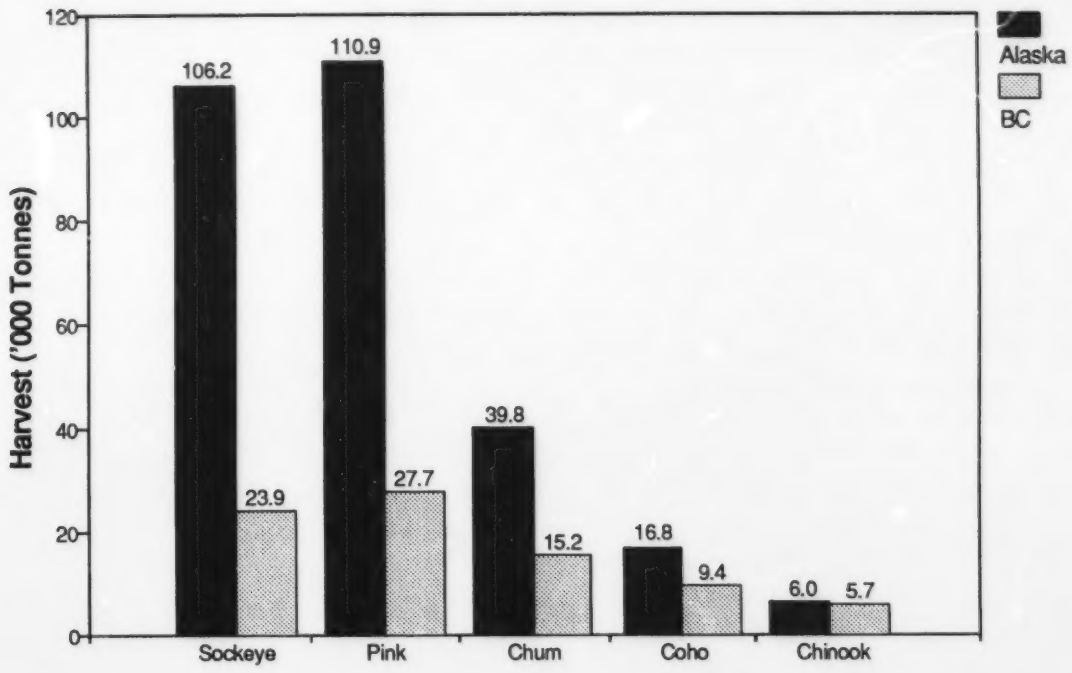
Handling Practices by Fishermen. A much greater share of the B.C. salmon harvest is caught by trollers compared to Alaska (20-30% in BC versus less than 5% in Alaska). Southeast Alaska is the only Alaskan area where trollers operate. Handling practices for troll-caught fish in terms of dressing, icing or freezing and individual attention is much better than for seine or gillnet-caught fish.

The Alaskan commercial harvest is taken in a much shorter season than is the British Columbia commercial harvest, especially the frantic Bristol Bay sockeye fishery. The 1990 sockeye harvest in Bristol Bay was 86,000 tonnes and took only ten days to harvest (the 86,000 tonnes is greater than the average annual total British Columbia salmon harvest over the 1980's). This huge volume in a short period of time results in poor handling practices (e.g. more fish are bruised).

We conclude that handling practices for salmon in British Columbia are better than in Alaska.

Harvest Location. The Alaskan salmon harvest takes place much closer to mouths of rivers and streams in which the fish spawn. This reflects fisheries management policy and the historical development of the fishery in Alaska. (Until the midpoint of the century, the bulk of the Alaskan salmon harvest was taken

Exhibit 6.1 Species Mix of Alaska and BC Annual Commercial Salmon Harvests 1981-1990



by fish traps set right in the spawning rivers). A significant share of the B.C. harvest is taken by net fisheries on salmon migration routes before the fish enter their spawning river, e.g., the Johnstone Strait sockeye and pink fishery targets on Fraser River stocks.

This practice, as well as the more significant troll fishery, results in fish of less advanced sexual maturity being captured. This represents an advantage in quality of salmon raw material to B.C. processors.

Timing of Harvests. The Alaskan fishery occurs earlier than in British Columbia. For example, the Bristol Bay sockeye fishery is finished by mid-July, a time when the B.C. fishery is just starting. Usually the first fish in the market reap some premium as buyers want to ensure themselves product. The earlier harvest then represents an advantage to Alaskan processors.

However, the short, condensed Alaska season limits the flexibility Alaska processors have in

putting salmon in the can versus the freezer. The short season underscores the reason Alaska has a much higher share of 1 lb talls in their pack. The fish must be processed expeditiously and this is facilitated by using a larger can size. Both advantages and disadvantages exist and, on balance, we judge that the timing of harvests is not a significant benefit to either party.

Raw Fish Prices. Both the British Columbia and Alaska salmon fisheries can be characterized as many fishermen-sellers facing few processors-buyers. However, Alaskan processors have relatively more buying power than B.C. processors.

Due to the remote location of many Alaskan fisheries and Alaska's much smaller population and business base, barriers to entering the Alaskan fish processing industry are greater. The potential new industry entrant in Alaska faces high costs. Moreover, it does not have access to as many custom-processing options.

A second and much more important difference between the two fisheries is that there is no collective bargaining over minimum prices in Alaska. Some would argue that because actual prices paid in B.C. generally are above minimum prices, the minimum price agreement has little impact. This is incorrect.

B.C. processors feel obligated to pay seine boat owners an end-of-season payment or bonus, regardless of product market signals, in order to correct for inequities in the salmon share arrangement (the 7/11-4/11 crew:boat owner split has persisted since the late 1940's when the operations were much more labour intensive). The minimum price agreement confers substantial benefits to seine crew members and limits the downward flexibility of processors in raw material pricing.

This was critically important in 1990 when large carryover, a weak market and pre-season forecasts of abundant catches in Alaska and B.C. would have indicated a decrease in the price processors paid for pink salmon. This adjustment did in fact occur in Alaska where pink prices to fishermen fell 30% from the 1989 level (see Exhibit 6.2). It also occurred in B.C. for troll-caught pinks where prices paid to fishermen can and do react quickly to the market.

In B.C. the price for net-caught pinks, however, went up $0.01 per pound as the 1990 minimum price increased from 1989. B.C. processors were prevented from adjusting to a vastly changing market. The minimum price for pinks in 1991 will increase another $0.01 per pound in violation of strong market signals indicating a very weak market.[1]

A third factor in raw salmon pricing is the much lower capital investment per fish harvested, and the much higher average harvest in Alaska. As noted in Section 5, there is considerable pressure on the B.C. fish processing industry to

1 *Our understanding is that the FPBA, and not the UFAWU, insisted on a three year minimum price agreement in the settlement of the 1989 strike.*

Exhibit 6.2: Prices Paid to B.C. and Alaska Salmon Fishermen

	Alaska[a]		B.C. ($ CDN/kg)[b]		
	$US/kg	$CDN/kg	Net	Troll	All
1988					
Sockeye	5.18	6.38	7.97	9.80	8.07
Pink	1.75	2.15	1.29	2.86	1.53
Chum	1.91	2.35	2.74	4.18	2.79
Coho	3.84	4.73	3.44	5.65	5.33
Chinnok	5.98	7.36	5.10	7.75	7.40
1989					
Sockeye	3.12	3.69	4.66	5.93	4.95
Pink	.96	1.14	.94	1.50	1.10
Chum	.90	1.07	1.38	1.57	1.39
Coho	1.80	2.13	1.88	2.43	2.31
Chinnok	4.09	4.84	2.85	4.34	4.10
1990					
Sockeye	2.62	3.06	4.07	5.24	4.33
Pink	.68	.79	.97	1.36	1.03
Chum	.97	1.13	1.57	1.91	1.57
Coho	2.16	2.52	1.88	2.81	2.66
Chinook	4.03	4.70	2.83	4.18	3.90

1990 Alaska Average Prices by Region (CDN/kg)

	Sockeye	Pink	Chum	Coho	Chinook
Southeast	3.86	.79	1.24	3.09	5.14
Troll	4.40	1.00	1.39	3.29	5.30
Net & Other	3.86	.79	1.21	2.05	2.10
Prince William Sound	5.55	.79	1.80	2.49	5.75
Bristol Bay	2.68	.66	.64	1.72	2.31
Other Areas	3.87	.83	1.00	1.77	4.37
Total	3.06	.79	1.13	2.52	4.70

Source: DFO sales slip data (1988, 1989); ARA Consulting Group estimates (1990).
Alaska Department of Fish and Game

[a] *Alaska prices for 1990 exclude end-of-season bonuses (bonuses are included for other years).*

[b] *B.C. prices include end-of-season bonuses, but exclude any payments for direct delivery.*

pay high salmon prices to keep the fleet viable.

All three factors cited contribute to bargaining power of B.C. fishermen. One would expect prices paid to net fishermen in British Columbia to be higher than in Alaska, everything else being equal. The recent evidence to support this Alaskan price advantage however, is not compelling.

The comparison of Alaska and B.C. net prices is most meaningful since the Alaskan chinook and coho data include significant amounts of SE Alaska troll landings (Exhibit 6.2). Much of the difference in sockeye prices between the two regions can be attributed to the high share of lower valued Bristol Bay sockeye in the Alaskan catch. The average price for non-Bristol Bay sockeye from Alaska in 1990 was an estimated $3.70 CDN per kg, before end-of-season bonuses, compared to $4.07 CDN for B.C. net-caught sockeye. The price of SE Alaska net-caught sockeye was $3.86 CDN per kg. The price of Puget Sound sockeye (destined for the fresh/frozen market) was $4.75 CDN per kg.

The price of Alaskan pinks was lower in 1990, in large part due to the inability of Canadian processors to lower prices. But the price of Alaskan pinks was higher in 1988 and 1989, with a substantial difference in 1988. As noted earlier, Alaska chinook earns a premium due to better flesh quality.

The above analysis of relative prices is problematic not only due to significant averaging in the data. The most crucial factor in determining relative raw material prices is not necessarily relative market power, but rather differences in costs and market returns. If one sector has lower labour and processing costs and the same product price relative to its competitor, then you would expect that sector to pay higher prices to fishermen (the price paid to fishermen is a derived demand). If, as is often claimed the U.S. has lower labour costs (see Section 6.2), then one would expect U.S. processors to be able to pay higher, not lower prices. There is a high degree of competition in salmon raw material markets in both British Columbia and Alaska.

We conclude that Alaskan processors have an advantage in raw material sourcing, not because of intrinsically lower cost, but rather because of greater flexibility in pricing. They can adjust raw material prices to the nuances of the market better than B.C. processors.

Additional Price Burden. B.C. fish processors incur additional costs over and above the payments to fishermen on the purchase of fish. Processors are liable for Workman's Compensation Board (WCB) payments of fishermen in full, and pay the employer share of fishermen's Unemployment Insurance (UI) premiums. This can add up to 5% to the purchase cost of fish.

Bargaining Association member companies are also liable for a payment per pound of net-caught salmon to the United Fishermen's Benefit Fund of the UFAWU at the end of the season (the 1990 payment was 1.8 cents/lb; the 1991 payment is 2.0 cents/lb). Bargaining Association member companies are at a disadvantage relative to non-member companies.

U.S. processors pay no such "social taxes". This is an advantage.

Fish Acquiring Costs. Fish acquiring costs are the costs of delivering the fish to the plant site from the harvesting location. They also include the cost of buying stations which act as transhipment centres prior to processing.

Certain Alaska fisheries such as Bristol Bay take place very close to processing plants. The same also occurs in certain British Columbia (e.g., Skeena River and Fraser River fisheries). As a general rule, B.C. salmon seine and gillnet fisheries take place farther away from the location of processing plants. At the same time, the costs of operating packers and collectors may be lower in B.C.

We conclude that fish acquiring costs do not represent a significant advantage to either Alaska or B.C. processors.

6.2 Labour

The fish processing industry needs access to a competitively-priced, productive labour force to be competitive with its rivals. The issues of labour costs, productivity and access are discussed.

Labour Costs. Unit labour costs comprise two components -- the direct wage paid plus payroll burden of vacation pay, unemployment insurance, health and medical premiums, etc.

B.C. Packers has estimated direct labour rates for 1989 at representative Alaskan[2] and Washington fish processing plants, and at British Columbia union and non-union plants (see Exhibit 6.3). The direct wage rate of B.C. unionized plants is substantially above those of its U.S. competitors and non-union competitors within the province. Moreover, apart from Washington State processors, B.C. union plants pay more in payroll burden than their competitors in Alaska and non-union plants in British Columbia. In Alaska and Washington it is common for fish processors to pay for employer-funded medical plans for full time employees but not for seasonal employees.

Overtime wages represent a larger share of the total production wage bill in BC than Alaska. Part of the reason appears to be less flexibility in the scheduling of salmon net fishery openings in BC. Openings invariably start at 6 PM Sunday. The result is that much of the catch must be processed on weekends at overtime rates.

The "All B.C. Fish Processor" category was calculated by weighting the union:non-union costs 75:25. The 75% weight is higher than the 60% share of total salmon and herring

2 *The B.C. Packers direct wage level for Alaska plants is similar to those indicated from a July 1989 statewide survey conducted by the Alaska Department of Labour. The survey indicated an average hourly wage of $6.78 ($US) for "cannery and cold storage workers". After allowing for an overtime premium and exchange rate conversion, this is similar to the $10.30 wage ($CDN) indicated by B.C. Packers.*

Exhibit 6.3: Representative Labour Costs of West Coast Fish Processors 1989

	United States		British Columbia	
	Alaska	Washington State	Union	Non-Union
	... $CDN per hour ...			
Direct Wages[a]	10.30	10.45	16.47	9.50
Payroll Burden	1.89	3.78	3.55	1.58
Total	12.19	14.23	20.02	11.08

[a] *Incudes overtime penalty*
Source: B.C. Packers

production that the majors process because several non-union plants pay union wages. Another consideration is that union plants other than the majors exist (e.g., the custom canner Great Northern Packing).

The results suggest that the total B.C. fish processing industry on average has higher labour costs than its American competitors. The greatest disparity in labour costs between industry segments is between B.C. union and non-union plants.

The importance of disparities in labour costs varies greatly among product lines. The labour cost of frozen-at-sea (FAS) salmon or sablefish may be less than 5% of sales value. The labour cost of hand-filleted ground fish, in contrast, can be 25% or more of the sales value.

Category	Labour Cost ($CDN/hr rounded)	Position Relative to B.C. Union Processors
B.C. Union Processors	$20	100%
Alaska Processors	$12	60%
Washington Processors	$14	70%
B.C. Non-Union Processors	$11	55%
All B.C. Fish Processors	$18	90%

The interpretation of labour rate differences is not straight forward because of potential differences in productivity and other factors.

Productivity. We have no direct evidence on differences in productivity between British Columbia and U.S. plants. Nevertheless, based on discussion with processors, we suggest the following:

- productivity in terms of output per person-hour can be affected by plant layout and other factors of production;
- productivity in terms of output per person-hour can be affected by in-plant quality standards, e.g., grading;
- B.C. Packers estimates that labour productivity in their U.S. canning operations is 5% less than in their B.C. operations (mainly due to lower throughput at their small U.S. plants);
- non-union plants in B.C. have greater flexibility than union plants in deployment of labour regarding roles and responsibilities, scheduling, flex time and other features. This allows certain non-union plants to have greater productivity than union plants.
- productivity in Washington State groundfish plants appears to be higher than in B.C. plants, in part due to piece work and other incentive provisions.

On balance we conclude that B.C. has a labour productivity advantage with salmon and herring, and a disadvantage with groundfish. It does not appear that the labour productivity advantage makes up for the wage rate disadvantage.

Access to Skilled Labour. Alaskan salmon processing occurs in remote areas during a short time period. Much of the processing labour is imported from out-of-state, mainly Washington. Students can represent a sizeable share of the workforce, especially in the Bristol Bay fishery. Processors in Southeast Alaska rely more on a local labour pool although they still utilize Washington State student labour.

In contrast, the B.C. processing industry is concentrated in Prince Rupert and the Lower Mainland and has access to a large labour pool. A high share of B.C. plant workers return each year whereas there is much turnover in Alaskan plant labour. The greater continuity allows better training which ultimately results in better workmanship and in-plant control.

Alaska processors ship roe herring frozen in the round to the Far East where the roe is stripped. B.C. processors, on the other hand, strip and fully process the roe in the province. The main reason for the difference is the logistical and cost problem with getting skilled people to remote Alaskan locations for roe processing. The timing of the herring fishery would indicate that they would have to import workers from Seattle.

British Columbia then has an advantage over Alaska in labour recruitment, training, and turnover. Of course, the higher wages paid in

B.C. can attract a better quality worker.

Additional Labour Costs. The use of much non-local labour in Alaska necessitates the need for feeding and housing plant workers in remote locations such as Bristol Bay (at company cost or subsidized rates). Bristol Bay processors also incur substantial costs flying in and out plant workers. It is common for a plant worker who stays the season to receive an end-of-season bonus. SE Alaska processors, as a general rule, do not incur these costs.

Certain regional Alaska processors then incur additional costs for camp infrastructure to accommodate plant labour.

6.3 Other Processing Costs

Transportation to Markets. Processors closer to the market have an advantage since their netback price from the market to the plant gate is higher. Bristol Bay processors shipping sockeye to Japan have an advantage through shorter transportation distances. For most other locations and especially for U.S. and Western Europe markets, Canadian processors have a freight advantage. The Alaskan canned salmon pack is freighted to Seattle from where it is distributed to U.S. and world markets. It is costly for Alaskan processors to access the fresh market in the United States.

We conclude that B.C. processors enjoy an overall transportation cost advantage over Alaskan processors. There would be no significant advantage with Washington State processors.

Energy Costs. Electricity costs in British Columbia and Washington State are comparable. Fossel fuel costs are much lower in Washington State. This has two effects. First, it lowers processing costs. Secondly, it provides an incentive to Canadian fishermen to deliver their catch to Washington State processors since fishermen can fill their fuel tanks at relatively low cost. A large trawler could save $5,000 or more on a single refuelling.

In Alaska electricity costs for fish processors would be at least 50% higher and perhaps more than double electricity costs in B.C.[3] Many Alaskan processing plants in remote areas operate their own diesel generators.

Lower energy costs therefore represent an advantage to Washington State processors. B.C. processors have an advantage in energy costs over Alaskan processors.

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3 *In 1989 large industrial electricity rates for SE Alaska communities were generally above 6 cents US/ kwh. Electricity costs for remote communities would be above 10 cents US / kwh. The April 1991, "General Use" electricity rate in Vancouver was 4 cents CDN/ kwh, approximately the same as in Bellingham, Washington. (The McDowell Group, Sitka Economic Base Study 1989, Report Prepared for Sitka Economic Development Commission May 1989 and B.C. Hydro, "Electric Tariff", Vancouver, April 1991.)*

Materials Delivered to Plant. British Columbia canners used to have a significant materials cost advantage over Alaska canners since the cost of delivering cans to Alaska plants was much higher (the cost FOB Vancouver and Seattle is similar). Many Alaskan processors have recently adopted the new "nesting can" which has cut down on shipping charges. This advantage has therefore diminished.

The majority of materials used in Alaskan fish processing, such as totes, are manufactured in the Lower 48 states. The costs of delivery to the plant site in Alaska are greater than in B.C.

The cost of totes, packaging and other materials before transportation considerations, could well be lower in the U.S. The majority of packaging forms used in the general agri-food industry cost more in Canada. This would suggest that delivered materials costs could be lower in Washington State compared to B.C., but higher in Alaska.

6.4 Demand Considerations

Product Quality/Reputation. British Columbia processors have a well-earned reputation for producing quality products -- a reputation that buyers and competitors acknowledge. Historically, the industry has earned a price premium in world markets for the "Product of Canada" mark.

The relative size of the premium depends on world wide supply and demand conditions. In years such as 1989 and 1990 when there was an oversupply of salmon, the price premium is greatly reduced. Japan still appears willing to pay a premium for Canadian sockeye even in today's soft market.

The superior quality of B.C. salmon product has reflected:

- a corporate decision by industry management that they want to be in the business of producing quality products;
- a way of differentiating their product from their competitors (B.C. produces only 10-15% of world salmon supply);
- the federal government regulation prohibiting the export of sockeye and pink salmon unless it was canned, or frozen dressed and deemed to be #1 grade (the regulation was initiated in the late 1970's and rescinded under the 1989 GATT ruling).
- stringent government regulations for plants that process fish products destined for the export markets.
- the much longer operating season in B.C. allowing greater in-plant quality control and grading.

Greater quality can provide two types of benefits: 1) a price premium, and 2) quality product will sell first. The latter results in less risk and lower inventory costs.

In short, product quality gives B.C. processors an edge in the marketplace. However, in the

present reality of world salmon oversupply, the edge has decreased and perhaps even disappeared for some products (e.g., canned pinks).

Branding of Canned Salmon. In the domestic canned salmon market the major companies have an advantage over imports through brand labels. The majors have nurtured and supported the domestic Canadian markets for canned salmon. They have brand labels for domestic sales, and allocate a share of each year's canned pack to the domestic market ("serve the label"). This is the second way B.C. processors have differentiated their product from the competition. Alaska processors do not have a brand in their domestic market. Canada also produces much more 1/4 lb tins of canned salmon.

A Natural Market. The United States with a population ten times that of Canada, provides Alaskan and Washington State processors with a distinct advantage. The large U.S. population provides a large natural market for industry output.

Niche Marketing. Marketing is an important way food processors can influence the demand for their products. Certain niche markets dependent on value-added processing of quality products have been developed by several processors (mainly small to medium size processors). The same is no doubt true for several U.S. processors in Alaska and Washington State.

We have no evidence as to the relative marketing prowess and success of B.C. and U.S. processors. However, we observe that Canadians generally have not developed a reputation for aggressive marketing in the agri-food business. In the pre-1989 seller's market, industry noted that salmon most frequently was sold on an allocation basis to a queue of clamouring customers, rather than through explicit marketing efforts. It is likely that both B.C. and U.S. fish processors could substantially improve marketing skills and efforts.

6.6 Synthesis of Findings

The comparative advantages of regional West coast salmon processors are summarized in Exhibit 6.4. The chart draws together the analysis of this and the preceding chapter on government policies and regulations. There is no clear cut overall advantage to one region over another. Each has strengths and weaknesses relative to its competitors.

The relative importance of each factor identified depends not only on the magnitude of inter-regional differences, but also on the role of the factor in the cost or revenue structure of the industry. As noted in Section 3.3, raw fish costs comprised 60% of sales revenues for FPBA companies in the 1980's. Labour costs were the next most important cost component at 13% of revenues.

Relatively small differences in raw material costs among regions, and to a lesser extent labour costs, then can be much more important than large differences in say the cost of energy.

Exhibit 6.4: Comparative Advantage Among Processors

Category	Advantages Among Regions			Advantage Within B.C.	
	B.C.	Alaska	Washington[a]	Majors	Others
Raw Material					
1. Quality	✔				
2. Economies via Harvest Volume				✔	
3. Handling Practices	✔				✔
4. Harvest Location	✔				
5. Timing of Harvest					
6. Raw Fish Costs		✔		✔	
7. Additional Price Burden		✔			✔
8. Fish Acquiring Costs					✔
Labour					
9. Wage Rates (inc. Burden)		✔	✔		✔
10. Productivity	✔				
11. Access to Skilled Labour	✔				
12. Additional Labour Costs	✔				
Other Factor Inputs					
13. Transportation to Market	✔				
14. Energy Costs			✔		
15. Delivered Materials	✔		✔		
Demand					
16. Product Quality/Reputation	✔				
17. Branding	✔			✔	
18. Natural Market		✔	✔		
19. Niche Marketing	✔				✔
Macroeconomic Factors					
20. Interest Rates		✔	✔		
21. Tax Rates		✔	✔		✔
22. Exchange Rates		✔	✔		
Government Policies					
23. Inspection		✔	✔		
24. Generic Promotion		✔			
25. Resources Taxes	✔				
26. Resource Management	✔				
27. Fleet Management		✔			
28. Tarriffs Post FTA					

a *Raw material issues not addressed for Washington State since the competitive "threat" involves a Washington State - based processor accessing BC fish stocks.*

Based on the existing cost structure of the industry (Exhibit 3.2) and the analysis in this section of comparative advantage, we judge the main strengths and weaknesses of the BC industry to be:

B.C. Strengths

- high product quality allowing access to niche markets
- lack of resource taxes
- strong resource management
- canned salmon branding
- access to skilled labour

B.C. Weaknesses

- rigid price structure for pricing raw fish
- higher wage rates
- cost burden on fish purchases (e.g. WCB)
- fleet management practices
- lack of a large natural market

The challenge is to build on industry strengths and to overcome industry weaknesses to the extent possible. So doing will require some fundamental changes in busines practices.

The next section outlines potential restructuring initiatives or strategies that the B.C. industry could pursue.

7.0 INDUSTRY RESTRUCTURING MEASURES

The world marketplace for seafood has changed dramatically. The rapid growth of the salmon farming industry has altered world supply-demand balances, and has also spurred a market appetite for fresh salmon. The current oversupply situation is due only in part to farmed salmon expansion, since harvests in the wild fishery have also escalated.

This large supply of world salmon is not projected to abate during the 1990's. In fact, farmed salmon production could double over the decade, depending on economics.

B.C.'s annual wild salmon catch is expected to average 90,000 to 100,000 tonnes during the 1990's, an increase of 10 - 20% over catches in the 1980's. Herring catches are projected to remain in the range of 30,000 to 50,000 tonnes annually.

The increases in salmon harvests have brought fundamental changes to the marketplace, and by implication to fish processors worldwide. The seller's market of the 1980's has turned into a buyer's market in the 1990's.

Moreover, seafood in general is facing intense competitive pressure from other food products such as poultry. The industrial economies of the world know how to produce and market food in abundance. Other countries and producers generally have greater marketing prowess than the Canadian seafood industry. These producers are aggressively pursuing market opportunities.

The B.C. industry cannot insulate itself from this new reality. It has to adapt to change. This may mean altering or abandoning some long term practices in buying of fish, product mix, and marketing.

Part of the industry's downturn has been due to adverse macroeconomic conditions including a weak domestic and world economy, a strong Canadian dollar, and higher interest rates relative to competitors.

In the Introduction we posed the question -- "Are the recent changes in the business environment of the industry symptomatic of short term cyclical swings, or are they more long term and fundamental in nature?"

The answer is some of both. Industry fortunes should improve with an upturn in the business cycle. However, the increased competitiveness in the marketplace requires some long term structural changes. The industry needs to make its cost structure more comparable with those of its competitors. It also requires improved marketing of its products and advantages.

7.1 The Institutional Environment

The analysis in previous sections focused on current business, regulatory, and market practices and trends. Significant changes in the institutional environment for the industry loom, particularly the settlement of native land claims. We discuss four key potential institutional changes and their impacts.

Settlement of Native Land Claims. The settlement process may entail the allocation of

specific quantities of fish mainly salmon, to native peoples. The impacts on processing and harvesting sectors depends on the form of negotiated settlements.

At one extreme, the native people could take their allocation in conventional tidal waters and deliver their catch to the existing processing sector. These strategies could involve minimal dislocation to existing processors. Dislocation to existing fishermen would be greater. A buy-back program for vessels and licenses or an explicit mitigation package would partially ameliorate adverse impacts.

Alternatively, the results of claims settlement may be greater harvests in-river, and natives choosing to develop their own processing facilities. This would result in lower volumes to existing processors, and could result in a lower quality of salmon of advanced sexual maturity that would be caught in-river. The lower volumes would reduce the economic viability of existing processors and result in loss of existing income and jobs. The degradation of product quality could result in displacement of existing processors selling high quality fresh/frozen products to niche markets. It is likely that a greater share of the aggregate catch would be suitable only for canning markets. Impacts on existing fishermen could also be severe.

It may not be in the economic interests of native people to harvest their allocation in-river and to build and operate their own processing plants. Lower product quality/prices and large costs for plant set-up and operation could inhibit such a move. The value of the resource would not be maximized through an in-river fishery.

The impact of land claims settlement then will depend not only on the size of the native allocation, but also on how the native people take the allocation.

The Recent GATT Ruling. Under the 1990 ruling, US processors have improved access to the province's raw salmon and herring. This poses a threat to the processing industry. The ruling may result in greatly increased competition in raw fish procurement. In essence a new buying fringe has been established. This could have adverse effects on processors and positive effects on fishermen -- a loss of raw material supply for domestic processors, an increase in prices to fishermen, or some combination of both.

The net returns to Canadian processors could decline whereas the net returns to Canadian fishermen could increase. If a Canadian processor relocated to Washington State, negative impacts on the processing sector would occur. Note that there is no evidence that the GATT ruling has hurt Canadian industry so far. Its ultimate impact is unknown at this time, and the likelihood of a Canadian processor relocating to the US is unclear (see discussion under Section 7.3.4).

Increased Allocation to Sports Interests. The sport fishery has grown in recent years. This growth will likely continue. This could have at least two adverse effects on the processing sector -- a loss of allocation of

prime sport species of chinook and coho, and a loss of other salmon species (since alterations in the regulations of sockeye and pink fisheries may be necessary to allow sufficient "pass through" of chinook and coho).

Interception or by-catch of steelhead by the commercial salmon fishery is a concern to recreational and environmental groups. This concern is especially acute for the Skeena River. There is growing pressure for the complete elimination of the commercial mixed stock gillnet fishery in the area. There is considerable pressure for restrictions and changes for all of the commercial fisheries in the area.

Increased allocations to the recreational fishery comprise a direct loss of fish available to commercial processing and harvesting sectors. The impact would be reduced revenues, incomes and jobs to the commercial fishing industry. From a Canadian societal perspective, there would be redistribution of benefits to anglers, commercial sport fishing operators and others.

Fisheries Management Changes. DFO is considering changes in management such as area licensing, individual transferrable vessel quotas (IQ's), and the harvesting of salmon closer to river mouths to address mixed stock fishery problems. Such changes undoubtedly would alter the allocation of raw material among processors (this has happened for sablefish under IQ's). The changes also could improve timing and quality of raw material supply.

The rationale for these changes is one or more of: an increase in harvest volume, an increase in product quality and price, a decrease in harvesting and processing costs, and a decrease in management costs. These beneficial impacts could be offset to some extent by certain potential negative repercussions. These include misreporting of catches under IQ's and the loss of high quality fresh/frozen grade fish through harvesting at river mouths.

7.2 Industry Attitude

Attitude is critical to industry planning for the 1990's for at least two reasons. First, a key to being competitive is to believe that you are competitive, and to have the ability/will to change when economic circumstances change. Secondly, it is also important how one views the changing economic circumstances.

If one views short term cyclical factors as the overriding concern, then this has some specific implications. One could take some short-term cost saving measures and wait for things to improve. Alternately, if the fundamental changes in the marketplace and competition are the main concern, then this paints a completely different picture of industry response.

As part of the consultative process on the project, we conducted a survey of processors in British Columbia and the U.S. (Alaska and Washington State). Industry's viewpoints on specific future developments were solicited. Exhibit 7.1 summarizes the results for the 15 BC survey respondents, representing over 60% of industry output, and the 8 US survey

Exhibit 7.1: Industry Viewpoints on the Future

Using a scale from 1 to 5 where 1 means strong disagreement and 5 means strong agreement, to what extent do you agree or disagree with the following statements? A score of 3 is neutral.

	Average Score by Processor Class		
BC Processors	**Major[a]**	**Other[b]**	**Total[c]**
1. Fish processing is more risky today	4.0	4.4	4.4
2. The future looks bright	1.7	2.2	2.2
3. Land Claims will have major impact	5.0	4.4	4.5
4. GATT ruling is major harm	4.7	2.9	3.3
5. In-river commercial fishery unworkable	4.0	4.5	4.4
6. Washington labour costs the same as BC	1.0	1.9	1.7
7. Exchange rates important to profitability	4.7	4.5	4.5
8. Benefits of inspection do not exceed costs	2.7	3.0	2.9
9. Resolving mixed stock problem important	3.3	3.2	3.2
10. 1990 was profitable year	1.0	2.5	2.2
11. Fraser River rebuilding important	4.0	3.5	3.6
US Processors		**Other[d]**	**Total[d]**
1. Fish processing is more risky today		4.0	4.0
2. The future looks bright		2.6	2.6
3. GATT ruling is a major benefit		1.8	1.8
4. In-river commercial fishery unworkable		3.6	3.6
5. Washington labour costs less than in BC		3.2	3.2
6. Exchange rates important to profitability		2.8	2.8
7. Benefits of inspection do not exceed costs		2.6	2.6
8. 1990 was profitable year		3.5	3.5

[a] *3 respondents*
[b] *12 respondents*
[c] *Simple average over 15 respondents*
[d] *8 respondents*

Source: BC and US fish processing industry surveys.

respondents.[1] Results were segmented by major processor and other (medium and small processor) categories. US industry respondents were all medium and small size processors.

BC industry perceptions were that:

1. Fish processing is more risky today
2. The future does not look bright for the industry
3. Land claims will have a major impact on operations
4. The GATT ruling poses some harm
5. An in-river commercial fishery is unworkable due to lower product quality
6. Washington labour costs are not the same as B.C.
7. Exchange rate fluctuations have a major affect on profitability
8. Company benefits of inspection balance costs approximately
9. Resolving the mixed stock problem is somewhat important
10. 1990 was an unprofitable year
11. Fraser River stock rebuilding is somewhat important

Industry responses varied by processor category and processor location or circumstances. Of note is that virtually everybody saw the settlement of land claims as a major factor, but native processors viewed settlement as a positive factor. Others viewed settlement as harming their operation. Other differences included:

- the major processors were more pessimistic about the future than other processors
- the majors saw far more negative effects of the GATT ruling (largely due to their emphasis on canning, their volume sensitivity and location)
- the majors see a greater difference in wage costs with Washington State competitors (some "other" respondents do not pay union wage rates)
- the importance of resolving the mixed stock problem was similar for the two groups, but regional processors saw changes in harvest location as hurting their ability to access high quality raw material (e.g. moving the Johnstone Strait sockeye fishery to the Fraser River mouth would lower quality and preclude Pt. Hardy processors from the frozen market).
- the 1990 year was more unprofitable for the majors.

An air of pessimism about the future was pervasive. Additional comments by BC processors on issues affecting their livelihood are quoted in Appendix E.

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1 *The McDowell Group of Juneau, Alaska conducted the US processor survey. They also provided secondary data on Alaska and Washington State fisheries.*

US processors had different viewpoints than BC processors on several issues. US processors viewed the industry as somewhat less risky and the future to be more promising than Canadian processors. US processors did not view the GATT ruling to be a major benefit, perhaps due to the fact few US respondents can salmon. Lower product quality from in-river salmon fisheries was deemed to be less a problem by US processors than by BC processors.

US processors also did not view exchange rate fluctuations as important to profitability (most of their sales are denominated in US dollars). Finally US processors appeared to have had a more profitable year than BC processors in 1990.

Next we identify several strategies which the British Columbia industry could adopt to improve its fortunes. These are not necessarily recommendations. We realize that there is no "across the board" solution . Markets, products and corporate strategies vary greatly among industry firms. The intent is to display a range of options available to industry.

7.3 Potential Restructuring Measures

The industry traditionally has been production-oriented rather than market-driven. The industry has been preoccupied with each firm's market share. The attitude has largely been that if a firm could secure adequate raw material, at whatever cost, then it could make money. This is no longer the case, if indeed it was ever true. Poor industry returns in 1989 and 1990, even in light of bumper harvests, put this theory to rest.

A change in philosophy is required. An increased emphasis on cost control, particularly for fish purchases, and marketing is needed for the 1990's. The industry is resource-constrained, and highly competitive in both raw material and final product markets.

Substantial price increases in real, inflation-adjusted terms are unlikely for seafood as well as other protein products. The industry should not count on substantially higher prices. What then can industry do?

7.3.1. Raw Material Purchases

The cost of raw material fish represents over 50% of the value of fish products. As such, it represents the area with the greatest potential impact of cost control or restructuring. The industry appears to have paid too much for fish to earn an adequate financial return.

At the same time, the price of fish is highly competitive. Processors have limited ability to control the price. They have greater control over what fish to buy and over certain arrangements governing purchase.

Buy Alaskan Fish. The price of Alaskan pink salmon is projected to be substantially less than the price in British Columbia for the major processors (1991 is the last year of the three year minimum price agreement). The majors

Exhibit 7.2: Potential Restructuring Measures

could actively pursue Alaskan supply as a way of diluting high fixed costs. The strengthening Canadian dollar facilitates this strategy.

Limit B.C. Fish Purchases. For 1991 rather than buy all the fish made available at the minimum price, processors could refuse to buy certain species (e.g. pinks) or impose boat limits. In the longer term, the companies could re-think their longstanding policy of never turning away a load of fish, even when the market suggests marginal or negative returns. Are the healthy margins on high valued species (e.g. sockeye) still there to compensate for poor returns on others (e.g. dark chum)? If they are, the question still remains: why cross-subsidize different species and products?

Fundamental Change to Minimum Price Agreement. Once the minimum price agreement expires after the 1991 season, the industry could negotiate a more flexible pricing arrangement. (The pricing of roe herring recently has evolved into a market sharing formula.) The benefit would be sharing of market returns and risk more appropriate to the cost / risk portfolio of processors and fishermen. Processors may be required to be more forthcoming with the UFAWU regarding their financial circumstances under such a strategy.

Change Seine Salmon Share Arrangement. The existing sharing arrangement between crew, boat and net owner was established in the 1940's. At that time, salmon seiners were table seiners employing crews of up to 8 people. In the last 50 years, the seine fleet has become much more technologically advanced and capital intensive. Average crew size has been reduced to 5 people. The 7/11 - 4/11 crew and boat and net owner share of the minimum price that was established in the 1940's still persists. The result is that processors feel compelled to pay the boat owner a payment over and above the minimum price to compensate for the inequity in the share arrangement. This payment occurs even when market returns do not justify it. If a more modern share arrangement could be negotiated, processors would be in a much better position.

Greater Control over Raw Fish Prices. In theory over the long term, the price paid to fishermen should be a net back from the market price after all costs and a normal return are subtracted. Potential exists for increased buying control through greater intelligence on market trends, and faster response times to changing market circumstances.

7.3.2. Marketing/ Product Development

A Commodity Focus. If an industry firm believes the business is turning into a cutthroat competitive business with no or little premium for quality, then the industry could change its focus into more commodity type products. Costs associated with product differentiation, quality and niche marketing, not justified by market premiums, would be curtailed.

Develop Niche Markets. Alternately the industry could exploit its several advantages through actively pursuing and developing niche

markets. While it is unlikely to "discover" another niche market like Japan for high quality frozen sockeye and herring roe, other opportunities may be available. For example, the GATT ruling represents an opportunity for B.C. exporters to tap the US market for fresh sockeye and pink salmon. Markets for portion-control products may hold potential.

More Aggressive Marketing. The processors could adopt a more aggressive marketing attitude. An increase in marketing emphasis is justified by today's buyer's market. Market opportunities were identified in Section 4.

Generic Promotion. The industry could encourage and support (financially and otherwise) a generic promotion campaign for B.C. fish products, especially salmon. The generic programs of ASMI, Norway and other jurisdictions are having an effect on the ability of B.C. processors to penetrate foreign markets. The B.C. Salmon Marketing Council is planned. A referendum of fisherman for a check-off system of 0.5% of landed value to support generic promotion is being conducted.

Penetrate U.S. Market for Canned. The US salmon canned market is underdeveloped relative to Canada. This represents an opportunity. The ability to tap this opportunity depends on many factors, such as the barriers to entry under an established US brand (e.g. Bumble Bee) and the Alaska marketing response.

Health and Safety Marketing. There is increased concern by consumers about the environment and source of fish products. In response, Canada's first rate inspection system and relatively clean environment could be actively promoted.

7.3.3. Efficiency Measures

Some efficiency, or non-raw material cost control measures are available to industry.

Reduce Unit Labour Costs. Labour costs per unit of output are affected by both wage rates and terms and conditions governing labour usage (e.g. overtime provisions, job descriptions, etc.). The unionized sector of the industry is at a disadvantage with US firms and non-union plants in British Columbia. Disparities in flexibility may be a greater concern than the actual base wage rates. Through the bargaining process with the UFAWU, changes could be effected.

Adopt Labour Saving Technology. Opportunity exists for greater mechanized butchering, and less hand dressing of fresh/frozen salmon. In contrast, the salmon canning process already is substantially machine-driven. There also is the long term potential for machine-filleting of groundfish, akin to practices in several European countries. Although machine processing may result in somewhat lower recoveries, this is not as great a concern in today's soft market -- "fish is cheap and labour is expensive". The economics now are more favourable towards machine processing. Some markets, however, give higher prices for hand-processed product (eg. hand-peeled vs. machine peeled shrimp).

Sharing of Facilities. Increased sharing of facilities and canning and freezing capacity could result in benefits to industry. Given the overcapacity of the industry, there appears to be no need for new facilities. Following the GATT ruling, at least one processor has noted a decline in custom processing charges in B.C. relative to Washington State. Custom rates may become more competitive.

7.3.4. Investment Behaviour

The industry is in no position to make major capital investments in the short-term. It needs to recover from the poor 1989 and 1990 years and build an equity reserve. The future is also perceived to be too risky under present uncertainties. In the long-term, investment decisions will be required.

Relocate Plant in U.S. The economies of building or expanding a cannery versus a fresh/frozen plant are completely different. It is likely that some new fresh/frozen plants will establish a foothold in B.C. and Northern Washington State to access B.C. stocks. The investment level, break-even throughput volumes, and risk are substantially less than for a cannery. There has always been substantial entry and exit in this sector.

We do not envisage a U.S. company setting up a cannery in Washington State dedicated to processing Canadian raw material. B.C. processors represent formidable non-price competition in terms of services such as net costs, moorage etc. as well as fishermen loyalty. The regulatory climate could also change.

There would be too great a risk of not being able to access raw material supply even if they offered higher prices. The existing competitive fringe of B.C. processors can not lure raw material from fishermen-sources of the majors through higher prices. There is no reason to expect a U.S. processor to be able to do so in great quantities.

An existing major processor located in B.C. could build a plant in Washington State when a replacement decision for the existing plant needs to be made. Unlike a U.S. processor, the current B.C. processor has existing fishermen-seller loyalty.

There presently is processing overcapacity in the province. The B.C. canneries generally are modern, well-maintained and have a significant remaining useful life. The reinvestment decision may not occur this decade for most canners.

Some other considerations are important:

- the replacement decision will be governed by a secure access to fish and the costs of operating.
- the costs of operating include not just labour costs but land, construction and other costs.
- the ultimate "take" or competition by U.S.-based processors post-GATT is unknown (there has been no evidence that the GATT ruling has harmed B.C. industry to date).

- there could be considerable animosity by Washington State commercial fishermen to Canadian fishermen delivering to a Washington processor. This could discourage investment.
- the future economic climate could change dramatically.

In conclusion, the likelihood of a major cannery starting operation in Washington State is unclear.

Purchase Plant in Alaska. Processors could purchase plants in Alaska. In fact, this has already happened for the majors.

Joint Ventures with Natives. Post land claims settlement, existing processors could forge joint venture processing initiatives with native groups. One issue would be the security of investment on native land.

7.3.5 Industry Liaison

The FCBC and UFAWU. Relations between the union and the majors are very poor and adversarial. Opportunity for mutual benefit exists through better cooperation and a better understanding of each other's constituency of interest.

Government Interaction. Opportunity exists in several areas:

- push government to lessen overcapacity of the fleet, and thereby lessen pressure by fishermen for high prices.
- better communications of needs, frustrations, etc.; and
- encourage SEP, Fraser River stock rebuilding, and other resource measures.
- push government to let the marketplace dictate the range of quality of fish products allowed for export;

The latter area refers to the need to be able to access lower quality export markets. It appears imprudent to have high export standards, not related to health and safety, for which the marketplace is not willing to pay. At the same time, the industry needs to be able to maintain access to certain high quality markets such as Japan, which are willing to pay a price premium. The whole issue of accommodating a range of product qualities without compromising quality reputation, through certification, inspection or grading, deserves more discussion and research.

7.3.6 Concluding Comments

In conclusion, we are not as pessimistic about the future as is the industry. The industry has exhibited the capability for change since its inception, and there are opportunities for continuing change and innovation.

The industry has an abundant, well-managed natural resource. It has access to a productive labour force, world class processing plants and a world reputation for the quality of its products. The industry needs to work with these assets and to adapt their philosophy and

practices to the new economic circumstances.

The restructuring measures identified are initiatives that industry can undertake directly. In addition there is much opportunity for benefits through greater communication and understanding between the various stakeholders in the industry -- processors, fishermen, industry organizations and federal and provincial governments.

The processing industry is not the only stakeholder undergoing fundamental changes. This overview study and the results contained within, can provide a forum for on-going communication between the various interests.

LIST OF LITERATURE

Alaska Seafood Marketing Institute, Salmon 2000, Juneau, Alaska, March 1991.

B.C. Ministry of Agriculture and Fisheries, "Commercial Fisheries in British Columbia",Victoria, [no date].

B.C. Ministry of Agriculture and Fisheries, Fisheries Production Statistics of British Columbia, Commercial Fisheries Section, Victoria, Annual.

B.C. Salmon Farmers Association, Evaluation of Price Collection Methodologies for Fresh Salmon, Report Prepared for Canada Fisheries and Oceans, Commercial and Market Analysis Division, March 1991.

Bevan, David "Boosting Confidence Through Inspection Programs", Aquaculture International Conference Proceedings 1990, Vancouver, pp. 205-209.

Brooks, Priscilla M., Jeffrey T. Gledthill, James L. Anderson and Sofia U. Bettencourt, The U.S. Market for Smoked Salmon: Implications for the Canadian Industry, Report Prepared for Canada Fisheries and Oceans, Economic and Commercial Analysis Report No. 70, Ottawa, August 1990.

Canada Department of External Affairs and International Trade, "Europe 1992 Working Group Report Fisheries", February 15, 1990.

Clarkson Gordon, Survey of the British Columbia Fish Processing Industry: Financial Results 1978-1982, Canadian Industry Report of Fisheries and Aquatic Sciences No. 146, Department of Fisheries and Oceans, Ottawa, December 1983.

The DPA Group, British Columbia Salmon Fleet Financial Performance 1981-1985, Report Prepared for Canada Fisheries and Oceans, Pacific Region, December 1988.

Egan, David and Gordon Gislason, U.S. Salmon Consumer Survey, Economic and Commercial Analysis Report No. 23, Prepared by the DPA Group for Canada Fisheries and Oceans, Ottawa, August 1989.

Fish Bargaining Association of British Columbia, "Submission to the Industrial Inquiry Commission into the Fishing Industry", April 1990 and January 1991.

Fisheries and Oceans Canada, Pacific Region, "1990 Fact Sheet", Vancouver, 1991.

Fisheries and Oceans Canada, Salmon Market Outlook, Market Analysis Group, Economic and Commercial Analysis Report No. 81, Ottawa, January 1991.

Kusakabe, Yuko and James L. Anderson, The Japanese Seafood Market: Salmon, Report Prepared for Canada Fisheries and Oceans, Economic and Commercial Analysis Report No. 21, Ottawa, April 1989.

Mackenzie, K.C. "Report of the Industrial Inquiry Commission: The Fish Processing Industry and the GATT Ruling", April 15, 1991.

McDorman, Ted L. "Using the Dispute Settlement Regime of the Free Trade Agreement: The West Coast Salmon and Herring Problem", Canada-U.S. Business Law Review, Vol. 4, 1990, pp. 177-189.

The McDowell Group, Alaska Seafood Industry Study: An Economic Profile of the Seafood Industry in Alaska, Report Prepared for the Alaska Seafood Industry Study Commission, Anchorage, Alaska, May 1989.

The McDowell Group, Sitka Economic Base Study 1989, Report Prepared for the Sitka Economic Development Commission, May 1989.

Pearse, Peter H. The Commission on Pacific Fisheries Policy Final Report, Vancouver, September 1982.

Price Waterhouse, The Economic Impacts of Fishing in British Columbia- 1988 and 1989, Report Prepared for the Fisheries Council of British Columbia, May 1990.

Shaffer, Marvin, An Economic Study of the Structure of the British Columbia Salmon Industry, Report Prepared for Canada Fisheries and Oceans, Vancouver, April 1979.

Shaw, S. and M. Gabbott, An International Study of the Marketing of Farmed Salmon, The University of Stirling Institute for Retail Studies, January 1990.

Task Force on Competitiveness in the Agri-Food Industry and Agriculture Canada, Factors Contributing to a Competitive Agri-Food Sector,, June 1990.

United Fishermen and Allied Workers Union, "Submission to the Industrial Inquiry Commission", March 1991.

APPENDIX A

B.C. PRODUCTION DATA

Wholesale Value ($000 CDN)

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
SALMON MARICULTURE	**na**	**157**	**898**	**985**	**1136**	**708**	**702**	**820**	**2728**	**13230**	**42779**	**85000**	**85000**
Sockeye	107817	81008	47416	122073	155363	83988	84191	206338	237871	147997	150134	291198	272000
Pink	39544	76867	50425	117302	13675	103767	38195	115160	96812	102293	160956	121199	80000
Coho	41023	57203	43568	37984	42582	39306	59624	48362	66090	61803	59134	45481	52000
Chum	50878	21262	63960	21653	42768	14735	34835	75907	77904	55926	145581	42085	77000
Chinook	35897	40475	3844	38051	41490	29489	45861	41433	31206	41489	57979	34071	35000
Steelhead	258	250	247	387	520	308	1032	857	895	445	842	257	500
Unclassified	28602	12562	15300	149	11536	5602	2833	2298	3339	3594	3629	3685	4000
Canned Pack of U.S.Fish	0	0	64347	36079	7404	7094	9670	21888	22106	12054	5375	48904	30000
TOTAL SALMON (WILD)	**304019**	**289627**	**289107**	**373678**	**315338**	**284289**	**276241**	**512243**	**536223**	**425601**	**583630**	**586880**	**550500**
Roe	138987	190376	35849	70890	79157	101491	91550	94416	79082	159688	158926	145508	152000
Herring Roe on Kelp	2521	5011	2448	3308	3900	6455	4508	5699	6372	10444	12934	8711	9000
Food & Bait	13523	6546	9919	8253	3391	3104	2898	3017	2833	3518	3676	3563	2000
TOTAL HERRING	**155031**	**201933**	**48216**	**82451**	**86448**	**111050**	**98956**	**103132**	**88287**	**173650**	**175536**	**157782**	**163000**
HALIBUT	**12827**	**17692**	**9962**	**10548**	**5488**	**9268**	**11640**	**15723**	**25521**	**33881**	**26766**	**27909**	**32000**
Sablefish	1687	4446	5205	6090	7081	7447	8829	14889	14140	16953	20566	17725	21000
Pacific Cod	5794	8712	6949	9534	7603	7452	7038	3590	5539	17284	10974	10078	7000
Sole	3718	5438	5976	5854	4723	4093	4913	5189	5834	5752	9418	10436	8000
Rockfish	5772	6349	9066	8257	5399	11828	14663	18501	27957	28910	28836	22232	16000
Hake	na	na	na	na	555	400	649	837	869	3414	983	1175	1000
Other	5355	9221	7725	11580	11570	10939	10961	17726	17066	22551	15075	24532	24000
TOTAL GROUNDFISH	**22326**	**34166**	**34921**	**41315**	**36931**	**42159**	**47053**	**60732**	**71405**	**94864**	**85852**	**86178**	**77000**
Crab	2839	3434	4292	3303	3285	3941	5639	5942	6082	9025	9196	8619	11000
Shrimp & Prawns	3332	2818	2407	3109	3381	2578	5059	5435	5658	11528	12038	15338	11000
Clams	1720	2475	2280	693	2343	2686	5010	4859	7425	10243	12748	11341	7000
Oysters	1169	1147	1274	1287	1229	1599	2483	2966	3254	3713	3982	4340	4000
Geoducks	857	2477	3585	3769	5162	4202	5175	4743	7088	12265	16066	15275	15000
Abalone	2152	1415	606	999	706	590	560	480	690	873	1059	1222	1000
Other	55	466	459	459	630	2255	2059	3454	4690	8352	12084	16173	8000
TOTAL SHELLFISH	**12124**	**14232**	**14903**	**13619**	**16736**	**17851**	**25985**	**27879**	**34887**	**55999**	**72199**	**72308**	**57000**
OTHER	**4340**	**5532**	**5082**	**10413**	**260**	**592**	**213**	**470**	**159**	**316**	**644**	**1569**	**1000**
TOTAL	**510667**	**563339**	**403089**	**533009**	**462337**	**465917**	**460790**	**720999**	**759210**	**797541**	**987406**	**1017626**	**965500**

Source: B.C. Ministry of Agriculture and Fisheries (1978-1989; 1989 estimates are preliminary); The ARA Consulting Group (1990 estimates).
* Includes the canned pack of U.S. fish purchased and canned by Canadian processors.

Value to the Fisherman ($000 CDN)

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
SALMON MARICULTURE	**na**	**157**	**898**	**985**	**1136**	**708**	**702**	**820**	**2728**	**12872**	**39084**	**74963**	**75000**
Sockeye	61752	49671	20595	62203	87593	41175	46052	120934	143270	87381	96408	169272	159100
Pink	16431	34862	16689	50417	3585	29662	10877	34702	25691	33479	49303	33481	26600
Coho	28602	46097	24142	23009	27269	23443	36541	27242	39264	33747	37688	19335	27900
Chum	38448	14418	40582	10851	28401	8474	14981	34889	37614	26779	84621	13778	26600
Chinook	30901	32826	25323	26842	32579	18348	38303	26216	19658	30527	43795	20157	20400
Steelhead	82	96	81	147	170	94	292	389	277	147	250	58	50
TOTAL SALMON (WILD)	**176216**	**177970**	**127412**	**173469**	**179597**	**121196**	**147046**	**244372**	**265774**	**212063**	**312087**	**256081**	**260650**
Roe	51022	122285	24125	32920	31579	46447	39137	56351	39238	96380	82183	67083	58000
Herring Roe on Kelp	1911	4581	2232	3008	3900	6455	4508	5699	6372	10444	12934	8711	8286
Food & Bait	4194	2131	2891	2177	450	491	720	1055	599	528	1340	526	427
TOTAL HERRING	**57127**	**126866**	**26357**	**38105**	**35479**	**53032**	**44365**	**63105**	**45610**	**107352**	**96457**	**76320**	**66713**
HALIBUT	**10001**	**14004**	**7341**	**6592**	**4715**	**6381**	**7222**	**10704**	**18765**	**24310**	**19703**	**15106**	**19142**
Sablefish	971	3057	3569	3735	6904	2777	6998	12082	12354	14546	18444	15058	16752
Pacific Cod	2271	3830	3326	2669	2097	2102	1765	1229	2166	8577	5766	4519	2900
Sole	1248	2169	2301	2186	1626	1673	2072	1686	1856	2472	4079	4798	3609
Rockfish	2587	2884	3102	2952	1967	2777	3978	6368	11832	13091	13524	12104	9630
Hake	na	na	na	na	270	347	560	745	881	1722	919	1108	1000
Other	2600	3772	2814	4244	5663	9130	6036	7866	7919	10723	8926	7505	7000
TOTAL GROUNDFISH	**9677**	**15712**	**15112**	**13818**	**18527**	**18806**	**21409**	**29976**	**37008**	**51131**	**51658**	**45092**	**40891**
Crab	1802	2267	2865	2634	2345	2866	4558	4719	5661	6452	6068	6089	9291
Shrimp & Prawns	1901	2497	2701	2551	2188	3211	4284	4559	4974	8935	9121	9900	8387
Clams	834	931	1080	677	827	1648	2763	3294	3868	7083	8068	7100	4738
Oysters	1021	893	1134	1030	981	1554	2109	2613	2551	2548	2725	2888	3000
Geoducks	569	1669	2310	2085	2813	1872	2937	4605	4294	6184	9807	12572	10094
Abalone	1864	1062	601	688	696	462	530	442	734	973	1096	1151	1347
Other	47	138	190	82	136	453	864	1302	1841	3128	4557	5407	5000
TOTAL SHELLFISH	**8038**	**9457**	**10881**	**9747**	**9986**	**12066**	**18045**	**21534**	**23887**	**35303**	**23116**	**45107**	**41857**
OTHER	**202**	**736**	**798**	**3289**	**297**	**529**	**225**	**309**	**243**	**492**	**709**	**2073**	**2000**
TOTAL	**261261**	**344902**	**188799**	**246005**	**249737**	**212718**	**239014**	**370820**	**394015**	**443523**	**542814**	**514742**	**506253**

Source: B.C. Ministry of Agriculture and Fisheries (1978-1989; 1989 estimates are preliminary); The ARA Consulting Group (1990 estimates).

Landings (round weight in tonnes)

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
SALMON MARICULTURE	**na**	**41**	**157**	**176**	**273**	**128**	**107**	**120**	**400**	**1931**	**6590**	**12385**	**14500**
Sockeye	21813	14532	7727	21000	30143	14326	12877	31569	30833	15035	11943	33675	36736
Pink	15228	24696	13718	38253	3977	39538	12059	37700	29505	26921	32217	29593	25947
Coho	8140	10342	9025	7514	9297	10461	10089	8977	13238	8415	7077	7704	10497
Chum	15808	4751	16809	6157	15091	4899	9003	23649	25197	11000	30297	9243	16879
Chinook	6987	6845	6540	5916	7092	5378	6254	5469	5007	5249	5921	4641	5237
Steelhead	57	48	52	81	104	57	150	202	158	75	93	32	45
TOTAL SALMON (WILD)	**68033**	**57881**	**53871**	**78921**	**65704**	**74659**	**50431**	**107565**	**103938**	**66695**	**87548**	**84888**	**95341**
Roe	63255	37284	16246	29300	27481	38928	32778	24400	15582	36835	29852	40210	39709
Herring Roe on Kelp	153	196	168	186	177	227	172	188	150	194	218	213	224
Food & Bait	18145	6181	8909	8663	1117	892	1080	1367	759	780	1531	585	297
TOTAL HERRING	**81553**	**37480**	**16414**	**38149**	**28771**	**39987**	**33875**	**25955**	**15732**	**37029**	**30070**	**41008**	**40230**
HALIBUT	**2294**	**2410**	**2668**	**2233**	**1690**	**1865**	**3110**	**3689**	**4201**	**4751**	**5048**	**3893**	**3464**
Sablefish	556	1401	2374	1911	4142	4414	3852	4263	4686	4717	5291	5494	4506
Pacific Cod	5396	7602	6514	5157	4686	4551	3662	2345	3668	13691	11024	9142	5502
Sole	3076	4208	4668	4282	2896	2724	3225	2782	2753	3022	5138	6352	5826
Rockfish	10305	8790	9669	9026	4669	6037	7489	11554	18781	17857	20016	18388	18835
Hake	na	na	na	na	2041	3070	4690	6002	6369	13112	6361	8604	8204
Other	9354	12075	9943	5029	19523	14597	15055	18171	15413	16789	17732	14934	15000
TOTAL GROUNDFISH	**28687**	**34076**	**33168**	**25405**	**34229**	**35393**	**37973**	**45117**	**51670**	**69188**	**65562**	**62914**	**57873**
Crab	1176	1179	1701	1191	895	839	1155	1165	1321	1631	1532	1522	2150
Shrimp & Prawns	1569	716	656	839	687	731	914	1192	1318	3264	3280	3119	2461
Clams	1587	1649	1760	755	981	1699	2622	2932	2947	4634	4841	3682	2221
Oysters	2613	2088	1798	1415	1579	2453	2897	3420	2864	3482	3702	3672	4000
Geoducks	1016	2463	2808	2620	3135	2717	3483	5167	5006	5734	4567	3965	3900
Abalone	433	186	97	73	82	56	58	42	52	49	49	48	50
Other	97	352	392	124	216	1195	1917	2466	3221	4391	5145	5180	5000
TOTAL SHELLFISH	**8491**	**8633**	**9212**	**7017**	**7575**	**9690**	**13046**	**16384**	**16729**	**23185**	**23116**	**21188**	**19782**
OTHER	**2532**	**1735**	**1770**	**20397**	**153**	**297**	**135**	**145**	**129**	**202**	**334**	**1044**	**1000**
TOTAL	**191590**	**142215**	**117103**	**172122**	**138395**	**162019**	**138677**	**198975**	**192799**	**202981**	**218268**	**227320**	**232190**

Source: B.C. Ministry of Agriculture and Fisheries (1978-1989; 1989 estimates are preliminary); The ARA Consulting Group (1990 estimates).

Frozen Salmon (000 kg)

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Sockeye	5224	4650	817	2962	9757	2133	3574	9241	9079	4819	3852	10585	
Pink	406	4884	1299	5686	413	4277	1746	6147	1624	5507	4457	6701	
Coho	4974	6827	4388	4196	5425	5722	7219	5627	6852	5642	4410	4967	
Chum	8370	3268	8572	2824	8643	2217	5523	10816	11420	6079	14287	4398	
Chinook	4478	4247	3745	3738	4013	2737	3985	3513	3020	3323	3996	3507	
Steelhead	41	36	33	56	86	53	149	137	157	56	87	35	
TOTAL	**23493**	**23912**	**18854**	**19462**	**28337**	**17139**	**22196**	**35481**	**32152**	**25426**	**31089**	**30193**	

Wholesale Value of Frozen Salmon ($000 CDN)

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Sockeye	33956	28179	4660	18415	52262	11178	25690	69504	78372	50110	54962	95643	
Pink	1425	16801	4469	17895	1303	11056	5589	19095	5091	23447	24600	21064	
Coho	32232	48130	26957	26895	33452	28105	51403	38508	45794	48066	46855	26822	
Chum	37916	16798	43442	12496	34287	8576	23734	42549	42994	32544	85913	16636	
Chinook	27137	31513	28499	31025	33398	20549	37121	34327	23760	31846	48988	26814	
Steelhead	194	203	188	323	421	265	866	693	749	315	603	187	
TOTAL	**132860**	**141624**	**108216**	**107049**	**155123**	**79729**	**144403**	**204676**	**196760**	**186328**	**261921**	**187166**	

Average Price of Frozen Salmon ($ CDN)

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Sockeye	6.50	6.06	5.70	6.22	5.36	5.24	7.19	7.52	8.63	10.40	14.27	9.04	7.90
Pink	3.51	3.44	3.44	3.15	3.15	2.58	3.20	3.11	3.13	4.26	5.52	3.14	3.00
Coho	6.48	7.05	6.14	6.41	6.17	4.91	7.12	6.84	6.68	8.52	10.62	5.40	5.60
Chum	4.53	5.14	5.07	4.42	3.97	3.87	4.30	3.93	3.76	5.35	6.01	3.78	3.60
Chinook	6.06	7.42	7.61	8.30	8.32	7.51	9.32	9.77	7.87	9.58	12.26	7.65	7.80
Steelhead	4.74	5.64	5.71	5.76	4.89	5.00	5.81	5.06	4.77	5.62	6.93	5.34	7.30
TOTAL	5.66	5.92	5.74	5.50	5.47	4.65	6.51	5.77	6.12	7.33	8.42	6.20	

Canned Salmon Pack (#48 lb cases)

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Sockeye	485748	295858	368844	622440	548948	371483	230789	583579	599320	309597	206715	634429	731500
Pink	456058	569337	472462	1020545	140415	996727	338474	1002477	900782	602539	734329	935033	777100
Coho	53960	43061	88217	61333	47246	60560	25832	39559	82375	29546	23715	66639	52900
Chum	121487	33689	176884	87866	74127	47120	68579	269070	264282	62909	215586	100525	115900
Chinook	8916	12953	7599	7839	7661	4306	2709	4769	6417	3667	3092	8855	6800
Steelhead	707	327	420	472	384	331	276	1025	599	424	620	235	500
TOTAL	**1126876**	**955225**	**1114426**	**1300545**	**818831**	**1480527**	**666668**	**1900479**	**1853775**	**1008682**	**1184057**	**1745716**	**1684700**

Wholesale Value of Canned Salmon Pack ($000 CDN)

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Sockeye	62511	47059	62287	109033	97230	66295	45897	117655	141505	82458	69099	172163	171900
Pink	37803	74316	54054	110086	16283	96722	38028	111656	100275	77155	132803	137260	84500
Coho	5689	5691	11874	8927	6892	8273	3791	5941	14631	5220	5007	14198	8700
Chum	9210	3137	17862	8465	5790	4421	6434	22788	20783	6309	29324	12591	12700
Chinook	651	1065	709	823	878	444	281	505	663	377	465	1277	600
Steelhead	50	31	41	49	43	37	25	97	59	54	86	27	50
TOTAL	**115913**	**131299**	**146827**	**237383**	**127115**	**176192**	**94455**	**258641**	**277916**	**171572**	**236785**	**337516**	**278450**

Average Price of Canned Salmon Per Case ($CDN)

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Sockeye	128.69	159.06	168.87	175.17	177.12	178.46	198.87	201.61	236.11	266.34	334.27	271.37	235.00
Pink	82.89	130.53	114.41	107.87	115.96	97.04	112.35	111.38	111.32	128.05	180.85	146.80	108.74
Coho	105.43	132.16	134.60	145.55	145.87	136.61	146.77	150.18	177.61	176.66	211.14	213.06	164.46
Chum	75.81	93.12	100.98	96.34	78.11	93.83	93.82	84.69	78.64	100.29	136.02	125.25	109.58
Chinook	73.01	82.25	93.25	105.01	114.61	103.02	103.57	105.87	103.26	102.74	150.44	144.21	88.24
Steelhead	70.19	93.49	98.73	104.22	111.98	112.52	89.46	94.39	99.12	126.64	139.51	114.89	100.00
TOTAL	**102.86**	**137.45**	**131.75**	**131.84**	**155.24**	**119.01**	**141.68**	**136.09**	**149.92**	**170.10**	**199.98**	**193.34**	**165.28**

Source: B.C. Ministry of Agriculture and Fisheries (1978-1989; 1989 estimates are preliminary); The ARA Consulting Group (1990 estimates).
• Includes the canned pack of U.S. fish purchased and canned by Canadian processors.

APPENDIX B

ALASKA PRODUCTION DATA

ALASKA DEPARTMENT OF FISH AND GAME / DIVISION OF COMMERCIAL FISHERIES

PRELIMINARY HARVEST AND EX-VESSEL PRICE DATA 1990 SALMON SEASON

(SUBJECT TO CHANGE)

AREA	species	avg. wt.	Price per pound	No. Fish (thousands)	Lbs. Fish (thousands)	Est. value (thousands)
SOUTHEAST						
	CHINOOK	16.25	$2.00	347.91	5,653.54	$11,307
	SOCKEYE	6.3	$1.50	2,146.35	13,522.01	$20,283
	COHO	6.65	$1.20	2,855.89	18,991.67	$22,790
	PINK	3.15	$0.31	32,306.73	101,766.20	$31,548
	CHUM	9.25	$0.48	2,201.30	20,362.03	$9,774
			totals	39,858.18	160,295.44	$95,701
PRINCE WILLIAM SOUND						
	CHINOOK	25.80	$2.24	22.16	571.81	$1,281
	SOCKEYE	6.6	$2.13	911.61	6,016.61	$12,815
	COHO	9	$0.97	524.27	4,718.47	$4,577
	PINK	3	$0.31	44,165.08	132,495.23	$41,074
	CHUM	9.1	$0.70	967.38	8,803.19	$6,162
			totals	46,590.51	152,605.30	$65,909
COOK INLET						
	CHINOOK	21.58	$1.15	17.67	381.21	$438
	SOCKEYE	6.45	$1.52	3,825.62	24,675.27	$37,506
	COHO	6.29	$0.75	509.12	3,202.36	$2,402
	PINK	3.39	$0.30	987.30	3,346.95	$1,004
	CHUM	8.42	$0.45	358.15	3,015.61	$1,357
			totals	5,697.86	34,621.40	$42,708
BRISTOL BAY						
	CHINOOK	17.28	$0.90	32.82	567.13	$510
	SOCKEYE	5.71	$1.04	33,164.65	189,370.17	$196,945
	COHO	7.55	$0.67	99.58	751.79	$504
	PINK	3.53	$0.26	517.47	1,826.65	$475
	CHUM	5.96	$0.25	1,007.96	6,007.46	$1,502
			totals	34,822.48	198,523.20	$199,936
KODIAK						
	CHINOOK	12.19	$1.10	18.81	229.29	$252
	SOCKEYE	5.2	$1.50	5,248.34	27,291.37	$40,937
	COHO	8.23	$0.60	293.70	2,417.15	$1,450
	PINK	3.18	$0.35	5,983.81	19,028.52	$6,660
	CHUM	7.69	$0.40	577.74	4,442.82	$1,777
			totals	12,122.40	53,409.15	$51,077
CHIGNIK						
	CHINOOK	16.5	$1.00	9.90	163.35	$163
	SOCKEYE	6.8	$1.55	2,090.70	14,216.76	$22,036
	COHO	6.25	$0.75	130.00	812.50	$609
	PINK	3.2	$0.30	550.00	1,760.00	$528
	CHUM	6.1	$0.45	270.00	1,647.00	$741
			totals	3,050.60	18,599.61	$24,078
AK PEN/ALEUTIAN IS.						
	CHINOOK	16.5	$1.00	30.41	501.77	$502
	SOCKEYE	6	$1.52	4,810.89	28,865.34	$43,875
	COHO	6.5	$0.75	498.56	3,240.64	$2,430
	PINK	3.3	$0.30	3,661.51	12,082.98	$3,625
	CHUM	7.2	$0.45	1,348.55	9,709.56	$4,369
			totals	10,349.92	54,400.29	$54,802

KUSKOKWIM						
	CHINOOK	16.7	$0.82	84.00	1,402.80	$1,150
	SOCKEYE	7.1	$0.76	203.89	1,447.58	$1,100
	COHO	7.1	$0.64	412.52	2,926.88	$1,874
	PINK	3.5	$0.08	15.89	55.61	$4
	CHUM	7.1	$0.27	550.39	3,907.78	$1,055
			totals	1,266.68	9,742.65	$5,184
YUKON /1						
	CHINOOK	19.5	$2.85	96.19	1,875.78	$5,346
	SOCKEYE	0	$0.00	0.00	0.00	$0
	COHO	6.8	$0.66	43.17	293.56	$194
	PINK	0	$0.00	0.00	0.00	$0
	CHUM	7.4	$0.28	441.84	3,269.63	$915
			totals	581.21	5,438.98	$6,455
NORTON SOUND						
	CHINOOK	19	$1.01	8.90	169.01	$171
	SOCKEYE	7.4	$0.87	0.43	3.21	$3
	COHO	7.5	$0.50	56.71	425.34	$213
	PINK (ROE)	0.15	$0.50	0.50	0.08	$0
	CHUM	7.4	$0.23	65.12	481.91	$111
			totals	131.67	1,079.54	$497
KOTZEBUE						
	CHINOOK	17.5	$2.00	0.03	0.53	$1
	SOCKEYE	7.4	$0.87	0.00	0.00	$0
	COHO	7.5	$0.50	0.00	0.00	$0
	PINK	0.15	$0.50	0.00	0.00	$0
	CHUM	8.94	$0.30	163.26	1,459.54	$438
			totals	163.29	1,460.07	$439
ALASKA TOTALS						
	CHINOOK	17.19	$1.83	670	11,516.21	$21,075
	SOCKEYE	5.83	$1.19	52,385	305,408.32	$363,436
	COHO	6.93	$0.98	5,454	37,782.36	$37,027
	PINK	3.09	$0.31	88,187	272,362.22	$84,432
	CHUM	7.77	$0.44	8,124	63,106.53	$27,767
			totals	154,819	690,176	$546,786

1/ The Yukon River includes both the Upper and Lower commercial management areas. Prices are generally much less for the Upper Yukon catch. Some of the Upper chum harvest has been estimated to include the number of males and females harvested to produce roe sold. Salmon roe sales on the Upper Yukon (all species) were worth approximately $540,350.

The ex-vessel price per pound is based on the average price shown on fish tickets and does not include any subsequent price adjustments. The are considered to be conservative estimates provided by Division staff or derived from inseason reports. Data are not for use for any legal interpretations. Prepared 02/27/91.
Filename: $almon.xls

STATE OF ALASKA
Commercial Fisheries Entry Commission
8800-109 Glacier Highway, Juneau, Alaska 99801
(907) 789-6160

1980 - 1989 Alaskan Salmon Harvest by Species
Pounds, Estimated Value, and Numbers of Fish in Thousands

Year	Species	Total Pounds Harvested	Estimated Gross Earnings	Average Statewide Price	Number of Fish
80	400 - SALMON ROE	353	$545	1.545	.
	410 - CHINOOK	12,501	$17,783	1.422	675
	420 - SOCKEYE	186,700	$109,544	0.587	33,296
	430 - COHO	22,425	$17,935	0.800	3,115
	440 - PINK	217,944	$77,097	0.354	63,304
	450 - CHUM	71,802	$32,069	0.447	9,603
Total		511,725	$254,973		109,993
81	400 - SALMON ROE	462	$681	1.475	.
	410 - CHINOOK	15,738	$23,731	1.508	823
	420 - SOCKEYE	225,956	$196,300	0.869	36,348
	430 - COHO	25,847	$23,696	0.917	3,416
	440 - PINK	244,968	$105,959	0.433	60,090
	450 - CHUM	99,541	$47,563	0.478	12,613
Total		612,512	$397,930		113,290
82	400 - SALMON ROE	408	$699	1.712	.
	410 - CHINOOK	16,904	$26,999	1.597	877
	420 - SOCKEYE	188,550	$155,863	0.827	28,954
	430 - COHO	46,541	$40,034	0.860	6,049
	440 - PINK	219,147	$47,503	0.217	64,849
	450 - CHUM	91,189	$39,163	0.429	11,090
Total		562,739	$310,261		111,819
83	400 - SALMON ROE	343	$353	1.030	.
	410 - CHINOOK	15,684	$18,238	1.163	828
	420 - SOCKEYE	305,641	$212,802	0.696	52,874
	430 - COHO	26,793	$16,160	0.603	3,653
	440 - PINK	194,081	$47,999	0.247	60,343
	450 - CHUM	79,117	$24,991	0.316	10,222
Total		621,659	$320,543		127,920
84	400 - SALMON ROE	344	$399	1.160	.
	410 - CHINOOK	12,524	$21,785	1.739	667
	420 - SOCKEYE	222,699	$171,873	0.772	38,428
	430 - COHO	44,515	$42,687	0.959	5,374
	440 - PINK	276,681	$70,466	0.255	76,277
	450 - CHUM	104,088	$36,290	0.349	13,105
Total		660,851	$343,500		133,851

PROJECT INDEX # GXHD1000 3/20/91
No excusionary criteria have been applied to data. Report includes some non-commercial catch.

S T A T E O F A L A S K A
Commercial Fisheries Entry Commission
8800-109 Glacier Highway, Juneau, Alaska 99801

1980 - 1989 Alaskan Salmon Harvest by Species
Pounds, Estimated Value, and Numbers of Fish in Thousands

Year	Species	Total Pounds Harvested	Estimated Gross Earnings	Average Statewide Price	Number of Fish
85	400 - SALMON ROE	479	$619	1.293	
	410 - CHINOOK	13,477	$20,787	1.542	721
	420 - SOCKEYE	221,508	$218,189	0.985	38,960
	430 - COHO	47,263	$42,599	0.901	5,730
	440 - PINK	304,258	$71,923	0.236	90,351
	450 - CHUM	83,365	$33,044	0.396	10,566
- Total		670,350	$387,161		146,328
06	400 - SALMON ROE	452	$679	1.502	.
	410 - CHINOOK	11,712	$17,775	1.518	616
	411 - JACKS	5	$1	0.224	1
	420 - SOCKEYE	194,557	$277,995	1.429	32,207
	430 - COHO	46,603	$42,009	0.901	6,293
	440 - PINK	259,255	$62,027	0.239	77,304
	450 - CHUM	97,097	$34,391	0.354	12,510
Total		609,681	$434,877		128,931
87	400 - SALMON ROE	210	$324	1.545	.
	410 - CHINOOK	13,282	$26,828	2.020	680
	411 - JACKS	7	$2	0.276	2
	420 - SOCKEYE	224,831	$348,170	1.549	35,431
	430 - COHO	25,312	$28,774	1.137	3,493
	440 - PINK	164,812	$69,089	0.419	46,493
	450 - CHUM	80,363	$37,141	0.462	10,527
Total		508,817	$510,328		96,626
88	400 - SALMON ROE	375	$1,180	3.151	.
	410 - CHINOOK	10,913	$29,579	2.711	589
	411 - JACKS	5	$1	0.281	1
	420 - SOCKEYE *	188,553	$443,231	2.351	30,038
	430 - COHO	35,455	$61,813	1.743	4,473
	440 - PINK	177,902	$141,285	0.794	50,357
	450 - CHUM *	121,632	$105,513	0.867	15,102
Total		534,835	$782,602		100,560
89	400 - SALMON ROE	569	$1,551	2.727	.
	410 - CHINOOK	11,314	$20,968	1.853	572
	411 - JACKS	21	$4	0.191	5
	420 - SOCKEYE *	264,518	$374,756	1.417	44,820
	430 - COHO	33,173	$27,075	0.816	4,649
	440 - PINK	331,467	$144,784	0.437	96,869
	450 - CHUM *	57,765	$23,510	0.407	7,213
Total		698,827	$592,648		154,128

PROJECT INDEX # GXHD1000 3/20/91
No excusionary criteria have been applied to data. Report includes some non-commercial catch.
* Bristol Bay Chum percentage not yet applied.

STATE OF ALASKA
COMMERCIAL FISHERIES ENTRY COMMISSION
8800-109 GLACIER HIGHWAY
JUNEAU, ALASKA 99801

SUMMARY OF SALMON WHOLESALE INFORMATION AS REPORTED IN COMMERCIAL OPERATORS ANNUAL REPORTS, 1984 - 1989
PROJECT INDEX # GXHD1030

Table 1 - Statewide Totals by Year and Process

Year	Process	Reported Net Weight (1000s lbs)	Percent Total Pounds	Reported Value (1000s $)	Percent Total Dollars	Number of Companies
84	FRESH	20,728	4.5	$35,631	4.8	120
	FROZEN	226,439	49.7	$360,212	48.7	123
	CANNED	196,882	43.2	$311,833	42.1	36
	OTHER	11,792	2.6	$32,560	4.4	57
84		455,841	100.0	$740,236	100.0	
85	FRESH	19,776	4.2	$32,377	4.3	108
	FROZEN	288,853	61.2	$474,230	63.0	130
	CANNED	150,951	32.0	$212,340	28.2	30
	OTHER	12,405	2.6	$33,995	4.5	46
85		471,985	100.0	$752,942	100.0	
86	FRESH	10,547	2.6	$19,502	2.6	80
	FROZEN	251,433	62.3	$483,458	64.5	110
	CANNED	133,369	33.0	$223,561	29.8	21
	OTHER	8,545	2.1	$23,511	3.1	37
86		403,894	100.0	$750,032	100.0	
87	FRESH	11,352	3.2	$30,318	3.5	82
	FROZEN	228,570	64.4	$547,025	63.0	110
	CANNED	107,905	30.4	$265,165	30.5	28
	OTHER	7,243	2.0	$26,045	3.0	41
87		355,070	100.0	$868,553	100.0	
88	FRESH	10,584	2.9	$35,134	3.1	71
	FROZEN	269,438	75.0	$846,315	73.5	108
	CANNED	74,656	20.8	$250,479	21.8	29
	OTHER	4,746	1.3	$19,620	1.7	36
88		359,424	100.0	$1151548	100.0	
89	FRESH	26,860	5.6	$42,723	3.8	68
	FROZEN	258,246	54.3	$605,559	53.6	99
	CANNED	184,868	38.9	$458,457	40.5	29
	OTHER	5,837	1.2	$23,910	2.1	34
89		475,811	100.0	$1,130,649	100.0	

STANDARD EXCLUSIONARY CRITERIA APPLIED TO DATA (GXHD1050)
1989 DATA PRELIMINARY

S T A T E O F A L A S K A
Commercial Fisheries Entry Commission
8800-109 Glacier Highway Juneau, Alaska 99801

Summary of Salmon Wholesale Information
as Reported In Commercial Operators Annual Reports, 1984 - 1989
Project Index # GXHD1030

Table 2 - By Year, Species, and Process

Year	Species	Process	Reported Net Weight (1000s lbs)	Percent Total Pounds	Reported Value (1000s $)	Percent Total Dollars	Number of Companies
84	Salmon Roe	Fresh	3,720	21.0	$9,676	18.8	41
		Frozen	3,526	19.9	$11,780	22.9	33
		Other	10,431	59.0	$29,948	58.3	40
84	Salmon Roe		17,677	100.0	$51,404	100.0	
84	Chinook	Fresh	1,650	17.4	$5,011	17.3	85
		Frozen	7,722	81.2	$23,683	81.8	98
		Canned + Other*	134	1.4	$252	0.9	29
84	Chinook		9,506	100.0	$28,946	100.0	
84	Sockeye	Fresh	4,103	2.5	$7,917	2.5	80
		Frozen	108,601	66.3	$197,514	61.8	94
		Canned	50,126	30.6	$112,472	35.2	31
		Other	999	0.6	$1,772	0.6	11
84	Sockeye		163,829	100.0	$319,675	100.0	
84	Coho	Fresh	3,645	11.3	$6,100	9.6	65
		Frozen	25,717	79.9	$52,897	82.9	98
		Canned	2,713	8.4	$4,523	7.1	24
		Other	114	0.4	$316	0.5	10
84	Coho		32,189	100.0	$63,836	100.0	
84	Pink	Fresh	2,720	1.6	$1,482	0.7	39
		Frozen	35,326	21.3	$24,682	12.2	90
		Canned + Other *	127,728	77.0	$176,951	87.1	31
84	Pink		165,774	100.0	$203,115	100.0	
84	Chum	Fresh	4,890	7.3	$5,446	7.4	62
		Frozen	45,546	68.1	$49,655	67.8	105
		Canned	16,219	24.3	$17,697	24.2	29
		Other	209	0.3	$461	0.6	5
84	Chum		66,864	100.0	$73,259	100.0	

Standard Exclusionary Criteria Applied to Data (gxhd1050)
* These species' canned and 'other' processes combined to comply with confidentiality restrictions.

S T A T E O F A L A S K A
Commercial Fisheries Entry Commission
8800-109 Glacier Highway
Juneau, Alaska 99801

Summary of Salmon Wholesale Information as Reported In
Commercial Operators Annual Reports, 1984 - 1989
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Table 2 - By Year, Species, and Process

Year	Species	Process	Reported Net Weight (1000s lbs)	Percent Total Pounds	Reported Value (1000s $)	Percent Total Dollars	Number of Companies
85	Salmon Roe	Fresh	1,748	14.0	$5,699	14.9	27
		Frozen	3,093	24.8	$9,433	24.6	36
		Other	7,629	61.2	$23,184	60.5	30
85	Salmon Roe		12,470	100.0	$38,316	100.0	
85	Chinook	Fresh	1,359	13.3	$3,610	13.0	80
		Frozen	8,713	85.3	$23,797	85.8	112
		Canned	127	1.2	$253	0.9	16
		Other	17	0.2	$88	0.3	6
85	Chinook		10,216	100.0	$27,748	100.0	
85	Sockeye	Fresh	4,935	2.9	$9,324	2.6	68
		Frozen	142,096	83.1	$289,470	80.2	105
		Canned	21,409	12.5	$56,097	15.5	27
		Other	2,576	1.5	$6,084	1.7	16
85	Sockeye		171,016	100.0	$360,975	100.0	
85	Coho	Fresh	1,590	4.4	$2,757	4.1	60
		Frozen	33,668	92.9	$62,231	92.7	107
		Canned	879	2.4	$1,736	2.6	16
		Other	94	0.3	$396	0.6	11
85	Coho		36,231	100.0	$67,120	100.0	
85	Pink	Fresh	3,427	1.9	$2,935	1.6	40
		Frozen	53,395	29.8	$37,743	20.2	87
		Canned	120,792	67.5	$143,824	76.9	19
		Other	1,358	0.8	$2,645	1.4	4
85	Pink		178,972	100.0	$187,147	100.0	
85	Chum	Fresh	6,716	10.6	$8,053	11.2	65
		Frozen	47,887	75.9	$51,556	72.0	118
		Canned	7,744	12.3	$10,430	14.6	23
		Other	731	1.2	$1,598	2.2	9
85	Chum		63,078	100.0	$71,637	100.0	

Standard Exclusionary Criteria Applied to Data (gxhd1050)

STATE OF ALASKA

Commercial Fisheries Entry Commission
8800-109 Glacier Highway
Juneau, Alaska 99801

Summary of Salmon Wholesale Information as Reported In
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Table 2 - By Year, Species, and Process

Year	Species	Process	Reported Net Weight (1000s lbs)	Percent Total Pounds	Reported Value (1000s $)	Percent Total Dollars	Number of Companies
86	Salmon Roe	Fresh	2,270	16.2	$5,940	14.2	18
		Frozen	4,636	33.1	$15,539	37.1	34
		Other	7,110	50.7	$20,400	48.7	28
86	Salmon Roe		14,016	100.0	$41,879	100.0	
86	Chinook	Fresh	1,026	11.8	$2,849	11.5	59
		Frozen	7,617	87.7	$21,717	87.9	92
		Canned + Other	43	0.5	$132	0.5	10
86	Chinook		8,686	100.0	$24,698	100.0	
86	Sockeye	Fresh	1,520	1.1	$3,699	1.0	50
		Frozen	117,580	85.0	$299,291	80.7	87
		Canned	17,932	13.0	$65,416	17.6	20
		Other	1,310	0.9	$2,656	0.7	6
86	Sockeye		138,342	100.0	$371,062	100.0	
86	Coho	Fresh	1,627	4.4	$2,726	3.6	43
		Frozen	32,547	88.9	$65,322	86.8	91
		Canned + Other	2,424	6.6	$7,180	9.5	18
86	Coho		36,598	100.0	$75,228	100.0	
86	Pink	Fresh	1,465	1.0	$827	0.5	28
		Frozen	37,763	25.9	$27,701	16.1	77
		Canned	106,696	73.1	$143,165	83.4	18
86	Pink		145,924	100.0	$171,693	100.0	
86	Chum	Fresh	2,640	4.4	$3,460	5.3	50
		Frozen	51,290	85.0	$53,888	82.3	96
		Canned	6,289	10.4	$7,726	11.8	18
		Other	111	0.2	$397	0.6	5
86	Chum		60,330	100.0	$65,471	100.0	

Standard Exclusionary Criteria Applied to Data (gxhd1050)

S T A T E O F A L A S K A

Commercial Fisheries Entry Commission
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Juneau, Alaska 99801

Summary of Salmon Wholesale Information as Reported In
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Table 2 - By Year, Species, and Process

Year	Species	Process	Reported Net Weight (1000s lbs)	Percent Total Pounds	Reported Value (1000s $)	Percent Total Dollars	Number of Companies
87	Salmon Roe	Fresh	3,192	24.5	$11,478	24.6	30
		Frozen	3,198	24.6	$11,049	23.7	27
		Other	6,619	50.9	$24,172	51.8	28
87	Salmon Roe		13,009	100.0	$46,699	100.0	
87	Chinook	Fresh	1,058	10.1	$4,096	10.4	50
		Frozen	9,343	89.2	$35,187	89.1	95
		Canned	59	0.6	$136	0.3	9
		Other	16	0.2	$81	0.2	8
87	Chinook		10,476	100.0	$39,500	100.0	
87	Sockeye	Fresh	2,125	1.3	$6,571	1.4	47
		Frozen	123,557	77.7	$350,776	73.4	92
		Canned	32,886	20.7	$119,035	24.9	26
		Other	532	0.3	$1,379	0.3	12
87	Sockeye		159,100	100.0	$477,761	100.0	
87	Coho	Fresh	354	1.9	$898	1.6	32
		Frozen	17,139	92.0	$50,779	93.1	84
		Canned	1,118	6.0	$2,736	5.0	15
		Other	16	0.1	$137	0.3	8
87	Coho		18,627	100.0	$54,550	100.0	
87	Pink	Fresh	842	0.8	$902	0.5	16
		Frozen	34,184	34.1	$39,131	23.2	76
		Canned	65,305	65.1	$128,899	76.3	20
		Other	6	0.0	$32	0.0	4
87	Pink		100,337	100.0	$168,964	100.0	
87	Chum	Fresh	3,781	7.1	$6,374	7.9	40
		Frozen	41,149	76.9	$60,103	74.1	96
		Canned	8,537	16.0	$14,358	17.7	22
		Other	54	0.1	$245	0.3	9
87	Chum		53,521	100.0	$81,080	100.0	

Standard Exclusionary Criteria Applied to Data (gxhd1050)

STATE OF ALASKA

Commercial Fisheries Entry Commission
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Summary of Salmon Wholesale Information as Reported In
Commercial Operators Annual Reports, 1984 - 1989
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Table 2 - By Year, Species, and Process

Year	Species	Process	Reported Net Weight (1000s lbs)	Percent Total Pounds	Reported Value (1000s $)	Percent Total Dollars	Number of Companies
88	Salmon Roe	Fresh	3,241	23.8	$14,813	23.2	29
		Frozen	6,280	46.1	$32,312	50.6	40
		Other	4,104	30.1	$16,693	26.2	23
88	Salmon Roe		13,625	100.0	$63,818	100.0	
88	Chinook	Fresh	780	6.6	$3,535	6.5	51
		Frozen	10,923	92.7	$50,408	92.9	92
		Canned	71	0.6	$304	0.6	12
		Other	6	0.1	$39	0.1	7
88	Chinook		11,780	100.0	$54,286	100.0	
88	Sockeye	Fresh	2,140	1.7	$7,510	1.4	44
		Frozen	114,628	89.8	$474,482	87.2	82
		Canned	10,322	8.1	$59,523	10.9	20
		Other	553	0.4	$2,322	0.4	11
88	Sockeye		127,643	100.0	$543,837	100.0	
88	Coho	Fresh	353	1.5	$899	1.1	35
		Frozen	22,466	92.6	$78,297	91.8	89
		Canned	1,427	5.9	$6,040	7.1	20
		Other	8	0.0	$66	0.1	7
88	Coho		24,254	100.0	$85,302	100.0	
88	Pink	Fresh	1,127	1.1	$1,869	0.8	25
		Frozen	42,983	43.0	$74,730	30.9	78
		Canned	55,770	55.8	$164,881	68.3	25
		Other	3	0.0	$20	0.0	5
88	Pink		99,883	100.0	$241,500	100.0	
88	Chum	Fresh	2,944	3.6	$6,508	4.0	42
		Frozen	72,159	87.7	$136,086	83.6	92
		Canned	7,065	8.6	$19,731	12.1	24
		Other	72	0.1	$480	0.3	8
88	Chum		82,240	100.0	$162,805	100.0	

Standard Exclusionary Criteria Applied to Data (gxhd1050)

STATE OF ALASKA

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Summary of Salmon Wholesale Information as Reported In
Commercial Operators Annual Reports, 1984 - 1989
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Table 2 - By Year, Species, and Process

Year	Species	Process	Reported Net Weight (1000s lbs)	Percent Total Pounds	Reported Value (1000s $)	Percent Total Dollars	Number of Companies
89	Salmon Roe	Fresh	4,323	31.3	$19,911	33.4	35
		Frozen	3,881	28.1	$17,189	28.8	36
		Other	5,618	40.6	$22,572	37.8	21
89	Salmon Roe		13,822	100.0	$59,672	100.0	
89	Chinook	Fresh	1,019	11.0	$2,974	9.8	42
		Frozen	7,779	84.2	$26,569	87.7	84
		Canned	387	4.2	$365	1.2	17
		Other	52	0.6	$383	1.3	9
89	Chinook		9,237	100.0	$30,291	100.0	
89	Sockeye	Fresh	1,412	0.7	$3,334	0.5	36
		Frozen	163,985	81.4	$453,955	74.7	76
		Canned	36,149	17.9	$150,263	24.7	24
		Other	29	0.0	$249	0.0	7
89	Sockeye		201,575	100.0	$607,801	100.0	
89	Coho	Fresh	1,086	4.4	$1,797	3.5	35
		Frozen	22,041	89.2	$45,131	87.1	73
		Canned	1,557	6.3	$4,759	9.2	19
		Other	22	0.1	$134	0.3	9
89	Coho		24,706	100.0	$51,821	100.0	
89	Pink	Fresh	12,521	6.8	$6,442	2.0	19
		Frozen	33,647	18.3	$29,204	9.2	60
		Canned	137,484	74.9	$282,416	88.8	25
		Other	1	0.0	$5	0.0	4
89	Pink		183,653	100.0	$318,067	100.0	
89	Chum	Fresh	6,498	15.2	$8,266	13.1	37
		Frozen	26,914	62.9	$33,511	53.2	80
		Canned	9,291	21.7	$20,654	32.8	22
		Other	113	0.3	$567	0.9	9
89	Chum		42,816	100.0	$62,998	100.0	

Standard Exclusionary Criteria Applied to Data (gxhd1050)
1989 Data Preliminary

Explanatory Notes:

Rounding of Data:

There are instances where the yearly totals provided in Table 1 do not equal the sum of the species totals provided in Table 2. Note that the reported pounds have been rounded to the nearest 1000. These type of discrepancies normally occur whenever data are organized by two different sets of criteria.

Excluded data:

Excluded data include salmon biproducts not destined for human consumption (e.g bait, oil, meal) and wholesale information for which no dollar value was received.

The total volume of salmon excluded by year is :

Year	Pounds (1000s)
1984	*** confidential ***
1985	*** confidential ***
1986	2,845
1987	2,073
1988	2,061
1989	534

Over the 1984 through 1989 time period the amount of salm biproducts excluded was 7,417 T pounds valued at $2,069 dollars. These data cannot be further disaggregated due to confidentiality restrictions.

Over the 1984 through 1989 time period the amount of salmon for which no wholesale value was provided was 2,077 T pounds. These data also cannot be further disaggregated due to confidentiality restrictions.

Other Production:

Other production includes salting, smoking and other miscellaneous processes.

Catcher/Sellers

Fishermen who catch and sell their own unprocessed fish are NOT required to submit Commercial Operator's Annual Reports.

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Dinneford
2/91

APPENDIX C

INVENTORY DATA

Exhibit C.1: U.S. Inventories of Canned Salmon

	Inventory 48 lb Cases					
	Chinook	Sockeye	Coho	Pink	Chum	Total
January 1						
1991	3043	875,630	29,946	2,611,817	132,135	3,652,571
1990	1,554	404,483	21,456	2,331,588	127,885	2,886,966
1989	1,906	139,867	16,911	759,057	82,406	1,000,147
1988	1,322	435,599	18,111	691,476	69,681	1,216,189
1987	584	194,725	28,713	1,317,739	132,003	1,673,764
1986	2,243	297,509	12,275	2,104,172	82,351	2,498,550
1985	6,237	757,127	29,332	1,831,456	241,576	2,865,728
1984	9,501	717,562	38,180	1,512,822	182,824	2,460,889
1983	5,457	358,089	32,147	1,602,966	256,059	2,254,718
1982	7,447	681,324	22,947	1,818,570	557,598	3,087,886
1981						2,102,403
1980						1,932,440
July 1						
1991	NA	NA	NA	NA	NA	NA
1990	1,504	171,765	7,306	1,063,827	75,360	1,319,762
1989	938	38,222	4,007	283,568	35,707	362,442
1988	1,031	124,175	6,003	101,973	14,026	247,208
1987	191	88,553	4,408	322,312	48,054	463,518
1986	1,687	59,205	3,903	540,269	43,595	648,659
1985	3,102	299,804	8,721	713,635	108,651	1,133,913
1984	7,908	276,518	7,783	394,648	48,526	735,383
1983	3,579	144,230	12,745	491,161	82,029	733,744
1982	5,811	392,433	14,373	899,644	339,496	1,651,757

Source: National Food Processors Association, Seattle.

Exhibit C.2: Comparison of U.S. Canned Salmon Pack and Inventories

	All Species 48 lb Cases		
	Pack	Inventory January 1	Inventory July 1
1991	NA	3,652,571	NA
1990	4,045,364	2,886,966	1,319,762
1989	4,217,282	1,000,147	362,442
1988	1,839,885	1,216,189	247,208
1987	2,357,465	1,673,764	463,518
1986	2,921,407	2,498,550	648,659
1985	3,223,843	2,865,728	1,133,913
1984	4,083,747	2,460,889	735,383
1983	3,776,246	2,254,718	733,744
1982	2,434,645	3,087,886	1,651,757
1981	4,634,647	2,102,403	
1980	4,367,196	1,932,440	
1979	3,313,613		

Source: National Food Processors Association, Seattle.

Exhibit C.3: British Columbia December Inventories of Frozen Dressed Salmon and Halibut, 1982 - 1990

	Salmon						Halibut
	Chinook	Sockeye	Coho	Chum	Pink	All[a]	
			···tonnes···				
December							
1990	634	1,033	445	4,138	440	6,784	719
1989	1,418	1,130	303	2,018	1,839	6,769	345
1988	1,532	683	751	6,311	458	9,974	1,472
1987	561	502	645	1,084	270	3,076	1,671
1986	927	1,130	993	6,064	184	9,381	436
1985	1,946	1,502	1,607	6,120	2,329	13,574	316
1984	1,237	492	796	1,547	331	4,431	1,148
1983	101	86	73	62	353	688	111
1982	1,567	479	1,661	3,883	83	7,703	188

a Includes unknown species.

Source: B.C. Ministry of Agriculture and Fisheries, "Monthly Report of Frozen Fish".

Exhibit C.4: Pacific Coast December Inventories of Frozen Salmon and Halibut

	Salmon			Halibut		
	US	BC	All	US	BC	All
			'000 tonnes			
1990	15.3	6.8	22.1	3.3	0.7	4.0
1989	18.0	6.8	24.8	4.5	0.3	4.8
1988	20.5	10.0	30.5	9.3	1.5	10.8
1987	12.2	3.1	15.3	8.1	1.7	9.8
1986	19.1	9.4	28.5	6.9	0.4	7.3
1985	27.3	13.6	40.9	2.7	0.3	3.0
1984	18.7	4.4	23.1	5.1	1.1	6.2
1983	17.9	0.7	18.6	3.4	0.1	3.5
1982	22.2	7.7	29.9	1.9	0.2	2.1

APPENDIX D

OTHER DATA

Exhibit D.1: Concentration Ratios Wholesale Value 1989

	Number Reporting Firms	Share of Total Sales Value		
		Big 4[a]	Top 4[b]	Top 10[c]
Salmon All	132	59%	59%	77%
Canned	36	83%	83%	97%
Fresh/Frozen Dressed	86	30%	35%	63%
Smoked (hot & cold)	44	0%	54%	75%
Herring All	28	61%	61%	89%
Herring Roe	17	66%	66%	96%
Spawn on Kelp	10	24%	44%	100%
Halibut	56	38%	51%	78%
Groundfish All	103	26%	36%	71%
Sablefish	34	5%	71%	91%
Shellfish All	122	2%	38%	59%
Shrimp & Prawns	60	<1%	64%	86%
Geoducks	17	0%	66%	93%
All Products	220	50%	50%	68%

[a] B.C. Packers, Canadian Fishing Co., Ocean Fisheries and J.S. McMillan Fisheries.

[b] The four firms with the highest sales value.

[c] The ten firms with the highest sales value.

Source: B.C. Ministry of Agriculture and Fisheries.

Exhibit D.2: Concentration Ratios Fish Purchases

	"Big Four" Companies 'Share of Fish Purchases[a]		
	1990	1989[b]	1988
Salmon			
Gillnet	59%	44%	54%
Seine	80%	69%	80%
Troll All	30%	25%	29%
Ice	33%	29%	34%
Freezer	22%	16%	18%
Total Salmon	63%	52%	65%
Herring			
Roe Herring All	67%		
Gillnet	50%		
Seine	79%		
Roe on Kelp	0%		
Other Herring	15%		
Total Herring	66%		
Halibut	29%		
Ground Fish	25%		
Shellfish	1%		
All	48%		

a Share of landed wright by the four companies: BC Packers, Canadian Fishing Co., Ocean Fisheries, and J.S. McMillan Fisheries.

b A strike year.

Source: DFO Sales Slip Data

Exhibit D.3: Exchange Rates

Foreign Currency per Canadian Dollar

	U.S. Dollar	British Pound	French Franc	German Mark	Japanese Yen
1978	.8770	.4568	3.945	1.757	182.5
1979	.8536	.4023	3.631	1.564	186.0
1980	.8554	.3677	3.609	1.552	192.9
1981	.8340	.4117	4.335	1.880	183.5
1982	.8103	.4634	5.305	1.966	201.4
1983	.8114	.5352	6.158	2.069	192.7
1984	.7723	.5780	6.725	2.191	183.3
1985	.7325	.5649	6.523	2.138	173.4
1986	.7197	.4905	4.975	1.556	120.5
1987	.7541	.4603	4.529	1.354	108.8
1988	.8124	.4560	4.826	1.423	104.0
1989	.8445	.5151	5.382	1.586	116.2
1990	.8570	.4806	4.658	1.382	123.6

Source: Bank of Canada Review, February 1991.

Exhibit D.4: Wholesale Prices of Alaska and B.C. Canned Salmon (48 lb cases)

	Alaska		B.C.
	$US/case	$CDN/case	$CDN/case
Sockeye			
1984	107.70	139.50	198.90
1985	125.80	171.70	201.60
1986	175.10	243.30	236.10
1987	173.70	230.30	266.30
1988	276.80	340.70	334.30
1989	199.50	236.20	271.40
1990	NA	NA	238.00
Pink			
1984	66.50	86.10	112.40
1985	57.20	78.10	111.40
1986	64.40	89.50	111.30
1987	94.70	125.60	128.10
1988	141.90	174.70	180.90
1989	98.60	116.80	146.80
1990	NA	NA	108.00

Source: B.C. Ministry of Agriculture and Fisheries (1984 to 1989); ARA Consulting Group (1990 estimates)

Alaska Commercial Fisheries Entry Commission.

Note: Differences in tin size of the canned pack affect the comparison of wholesale prices.

Exhibit D.5: Wholesale Prices of Alaska and B.C. Frozen Salmon

	Alaska		B.C.
	$US/kg	$CDN/kg	$CDN/kg
Sockeye			
1984	4.01	5.19	7.19
1985	4.49	6.13	7.52
1986	5.61	7.79	8.63
1987	6.26	8.30	10.40
1988	9.13	11.24	14.27
1989	6.10	7.22	9.04
1990	NA	NA	7.90
Coho			
1984	4.53	5.87	7.12
1985	4.07	5.56	6.84
1986	4.40	6.11	6.68
1987	6.50	8.62	8.52
1988	7.68	9.45	10.63
1989	4.51	5.34	5.40
1990	NA	NA	5.60
Chum			
1984	2.40	3.11	4.30
1985	2.37	3.24	3.93
1986	2.32	3.22	3.77
1987	3.22	4.27	5.35
1988	4.16	5.12	6.01
1989	2.74	3.24	3.78
1990	NA	NA	3.60

Source: B.C. Ministry of Agriculture and Fisheries (1984 to 1989); ARA Consulting Group (1990 estimates)

Alaska Commercial Fisheries Entry Commission.

Exhibit D.6: Canned Pack in Canada of U.S. Fish

	Number of 48 lb Cases					
	Sockeye	Chinook	Coho	Pink	Chum	All
1990	49,900	400	3,900	150,400	7,400	212,000
1989	22,764	570	4,960	285,429	5,129	318,852
1988	10,207	2	1,467	4,210	3,750	19,636
1987	23,168	179	6,578	30,859	6,288	67,072
1986	28,104	323	12,037	105,586	23,739	169,789
1985	2,265	15	2,557	175,674	10,964	191,475
1984	9,965	18	1,094	62,245	11,236	84,558
1983	6,011	12	505	56,059	474	63,061
1982	17,199	46	107	36,859	1,042	55,253
1981	88,261	214	3,156	160,496	7,016	259,143
1980	135,037	74	646	73,789	3,594	217,140

Source: B.C. Ministry of Agriculture and Fisheries (1989 and 1990 numbers are preliminary)

APPENDIX E

INDUSTRY COMMENTS

Selected industry comments of individuals contacted in the study are reproduced below under six general headings. Comments by Canadian processors are identified by company size category. Comments by U.S. processors are identified by region.

I BUSINESS ENVIRONMENT, PHILOSOPHY AND RISK

1. "We want to have opportunity to access fish under rules which historically have been in place" [major processor]

2. "Seafood is our business and we're in it for the long haul" [major processor]

3. "The industry bets in advance on the sales price" [major processor]

4. "Common sense has to prevail otherwise plants will be without work" [major processor]

5. "The system under which we bought fish for the past 20 or more years is not really appropriate today" [major processor]

6. "The excess processing capacity in the industry means more competition on the grounds" [major processor]

7. "We are buying fishermen not fish" [major processor]

8. "Should we still try to put only best quality fish on the world market?" [major processor]

9. "Very few industries put up a year's supply of product in a short period of time" [other]

10. "Volume contributes to productivity of plants" [other]

11. "Quality is the name of the game in any fish business" [other]

12. "There is a competitive market for fishermen" [other]

13. "Herring roe is totally speculative. There is a one time turnover of inventory" [other]

14. "We live by volume in this industry" [major processor]

15. "The BC processing industry is well sourced/connected to support industries" [medium size processor]

16. "Do we want to become like Bristol Bay where the fish is not even gutted before export to Japan?" [medium size processor]

17. "There may not be enough margin around to support the existing industry structure" [medium size processor]

18. "We are sitting on desperation. Everything we do is aimed at surviving" [major processor]

19. "Recent events have the potential to fracture the industry" [major processor]

20. "BC processors are investing in Alaska for survival" [major processor]

21. "The Canadian industry has no ability to control work on weekends" [major processor]

22. "Productivity depends on how the cannery is set up" [major processor]

23. "The commercial industry can produce fish at a lower price than farmed" [major processor]

24. "The can is here as long as we are" [major processor]

25. "We have less production than the US so we should attempt to aim at the high end of the market" [medium size processor]

26. "Processors in future will not take on responsibility of purchasing endless quantities of fish for which there are no markets or only unprofitable markets" [major processor comment made in 1984]

27. "My family has been in the fishing business for several generations. I doubt that my son will however. This makes me very sad" [medium size processor]

28. "Prices paid to fishermen react much slower than does the market" [medium size processor]

29. "The currency risk on the Japanese yen plays havoc with herring roe" [medium size processor]

30. "We made a management decision 5 years ago not to invest in any new ventures that were labour intensive" [medium size processor]

31. "This year we'll dress part of the salmon catch by machine rather than by hand. We know recoveries might be lower but fish is cheap and labour is expensive" [medium size processor]

32. "The attitude of the big guys has been that the fleet is sacred, but now they might be starting to recognize problems with this philosophy" [medium size processor]

33. "Cooperation from local and state governments is making less work regulations for us" [SE Alaskan processor]

II MARKETS, PRODUCTS AND MARGINS

1. "The world's awash with salmon" [major processor]

2. "During an average production year, the BC industry has an edge in product quality which reflects in better sales prices. This however diminishes in years of high production (e.g, 1989 and 1990)" [medium size processor]

3. "We need to produce products that can be distributed to food distributors" [medium size processor]

4. "The better the quality, the better the margin" [major processor]

5. "There are no bad debts in canned" [major processor]

6. "The US canned salmon market is underdeveloped relative to Canada. The opposite is true for tuna" [major processor]

7. "We earn the best margins on our franchise business as opposed to our commodity business" [major processor]

8. "The world wide increase in aquaculture production is making margins very tight" [medium size processor]

9. "Market saturation is the new reality. Farmed salmon is the new influence in the cyclical nature of markets" [other]

10. "BC processors are head and shoulders above the US in producing a quality product" [medium size processor]

11. "Fringe players are contaminating the market for frozen salmon" [medium size processor]

12. "Smokers and reprocessors need a premium product but chain stores do not. The chain and ultimate consumer does not know or care about quality, just price" [medium size processor]

13. "Japan is quality conscious" [major processor]

14. "The Japanese eat with their eyes" [other]

15. "The domestic canned market is more stable, less risky than the export canned market" [major processor]

16. "Each can size within a species lives within its own supply/demand world" [major processor]

17. "The Westernization of the Japanese palate has also had an influence on the value of salmon imported from B.C." [other]

18. "Our sockeye is the best. It has a higher fat content and a brighter flesh colour than Bristol Bay reds" [other]

19. "Japan likes the 'Product of Canada' label" [medium size processor]

20. "John West refuses to buy canned salmon from previously frozen fish" [medium size processor]

21. "We are very proud of the quality of our canned salmon, but now we're getting the same price as Bristol Bay canned sockeye which isn't even washed. Why should we continue to produce a quality product?" [major processor]

22. "Price is, and always has been a major factor in moving salmon. However, quality is a major factor in the ability of a processor to find a market at any price. Quality product will sell first" [Washington State processor]

23. "Canned salmon is undermarketed in the UK" [UK consultant]

III COMPETITIVENESS

1. "World production of salmon and herring seems to be ever increasing. Our raw material and production costs must be lowered to reflect a market price needed to move the larger volumes" [medium size processor]

2. "We have to have the same cost structure as Alaska and Washington State processors" [major processors]

3. "We can live with higher labour rates on salmon, but labour is much more important on low valued items where it makes up a major share of the selling price" [medium size processor]

4. "Plant workers in BC plants are better trained, more productive than US plant workers" [medium size processors]

5. "BC does a way better job than Alaska at canning salmon" [medium size processor]

6. "In high value, high quality products BC can compete; in lower value, lower quality products, the US has some advantages" [medium size processor]

7. "A lot of fish from the West Coast of Vancouver Island goes past the doorstep of Blaine or Bellingham on its way to Vancouver" [medium size processor]

8. "The more processing you do, the more competitive you are on the world stage" [medium size processor]

9. "BC will have a tough time competing in world salmon markets on a commodity basis because costs are too high" [major processor]

10. "The FTA will promote Canada as a hewer of wood" [major processor]

11. "Processors may be better off to shut down the Canadian fishery and process US fish only" [major processor]

12. "Hopefully the glut is a short term problem, but you still have to have a supply of fish at the right price" [major processor]

13. "We need a more productive and disciplined workforce with a more flexible attitude the work rules" [major processor]

14. "Some overtime hours in Canadian plants would not be overtime hours in US plants" [other]

15. "The real threat of the GATT/FTA ruling is Japan not the US" [medium size processor]

16. "A processor would have to be out of their mind to open a canning plant in Washington to can Canadian fish" [US processing association]

17. "We have no fresh market access" [SE Alaska processor]

18. "The lifting of Canadian export restriction would benefit us if we could buy direct from Canadian fishermen without the fish passing over a Canadian dock or vessel. We then could compete price-wise" [SE Alaska processor]

19. "We have a very difficult time exporting salmon into Canada whereas Canadians are free to move salmon into the US market with very little cost disadvantage" [SE Alaska processor]

20. "Automation will cut labour costs and increase efficiency" [SE Alaskan processor]

21. "Regional cost differences in Alaska are probably greater than those between SE Alaska and Prince Rupert" [Alaska consultant]

IV FISHERIES MANAGEMENT AND GOVERNMENT LIAISON

1. "DFO has done a good job protecting and rebuilding the resource" [major processor]

2. "SEP has fostered a good public attitude towards the resource" [medium size processor]

3. "DFO has less than a friendly attitude toward the industry" [medium size processor]

4. "DFO has moved from being a regulatory agency to one with a significant political will. DFO is increasingly adversarial and far more unpredictable than in the past" [medium size processor]

5. "A move towards a terminal fishery will kill any regional processor who is involved in value-added processing" [medium size processor]

6. "To deliver increased volumes to sport fisheries, management changes would be required for sockeye and pink fisheries, resulting in reduced volumes and poorer quality terminal fish" [major processor]

7. "IQ's will eventually lead to the decimation of the industry despite efforts by SEP and other agencies to build the resource" [major processor]

8. "We should be settling land claims first before implementing management changes such as IQ's and area licensing. We are trying to do too much too quickly. We should understand the rules of the game" [major processor]

9. "We need government to change its present negative attitude towards the processing industry" [major processor]

10. "The industry processes a public resource. Therefore, it is natural to have government interest and intervention in our operations" [major processor]

11. "Shorter seasons are a threat to keeping good people" [major processor]

12. "All conservation cannot be done by the commercial sector" [major processor]

13. "Area licensing for herring has worked with little disruption, or burden to industry" [major processor]

14. "Marrying the GATT ruling with the introduction of IQ's is disastrous" [medium size processor]

15. "Terminal fisheries will kill some small and medium-sized processors, not so much because of logistical considerations, but because they are geared toward higher valued niche markets. Terminal fisheries won't given them the quality they need" [medium size processor]

16. "The IQ system has hurt us. We have had a buying station for black cod at XXX for years. This year we couldn't even buy any and our investment there seems lost" [medium size processor]

17. "The processing industry thinks it has been treated by government as a second class citizen. Government views Natives, sports interests and commercial fishermen as more important than processors. The processors of course think they are the most important. The truth is somewhere in between" [medium size processor]

18. "Individual quotas could be the end of Southeast Alaskan processing plants" [SE Alaska processor]

19. "Timing and management of fisheries is intelligently done in Canada which gives maximum recovery of the value of the resource" [SE Alaskan processor]

20. "Individual quotas will result in higher fish costs" [SE Alaskan processor]

V NATIVE LAND CLAIMS AND IN-RIVER FISHERIES

1. "The further upriver one goes, the poorer the quality -- both for canned and more particularly frozen for overseas markets" [major processor]

2. "Government will find it easier to give fish rather than land for settlement of Native Land Claims. The common man on the street does not understand fish" [medium size processor]

3. "The fishing industry should not have to pay a disproportunate share of the land claims price" [other]

4. "The only things the government can act on quickly regarding land claims is money and fish" [other]

5. "The fishing industry has more experience working with natives than any other resource sector" [other]

6. "How much food value is left in a river-caught fish?" [medium size processor]

7. "The problem with commercial harvests in-river is that there will be pressure to maintain the fishery every year no matter what the run size is" [other]

8. "Whatever happens under land claims, we need an orderly transfer" [major processor]

VI OTHER

1. "The sports fish lobby group has done a good job of saying they are important economically" [other]

2. "Bristol Bay fishermen have other jobs but BC fishermen expect to make a living solely from fishing salmon" [other]

3. "The lysteria problem with smoked salmon is just a new trade barrier the US invented to replace the tariff lost under the FTA" [medium size processor]

4. "SE Alaska has a lot more in common with northern BC than with the rest of Alaska" [medium size processor]

5. "The BC industry has much to be proud of" [medium size processor]

6. "I realize that there are some winners and losers under the FTA, but it doesn't look good for an industry such as this that has to be sacrificed" [medium size processor]

7. "The future industry in BC will either involve more concentration, or will break down into a complete cottage industry" [medium size processor]

8. "Bristol Bay has a lot of whistle stop help such as university students" [major processor]

9. "Strikes have seldom followed a poor year" [other]

10. "As the catch from the Japanese high seas fleet diminished, the demand for imported salmon increased. Conversely, the product of the Hokkaido chum salmon hatcheries decreased demands for imported chum" [other]

11. "Minimum prices tend to be related to canned" [major processor]

12. "There has never been a botulism problem with Canadian canned salmon" [major processor]

13. "If we have another year this year like we had during the last two, some B.C. companies will take some major hits" [major processor]

14. "Relations between the majors and the Union are very bad right now. Admittedly, we've contributed to this" [major processor]

15. "As seafood becomes more and more important and recognized in the American diet, seafood producers will earn the respect cattle ranchers have always enjoyed -- both at the bank and at the opera" [SE Alaskan processor]